1985

Economic Genuine Link: Impacts on Liberian Flag Shipping

Victor E. Dougba
University of Rhode Island

ECONOMIC GENUINE LINK: IMPACTS ON LIBERIAN FLAG SHIPPING

BY
VICTOR E. DOUGBA

A Thesis Submitted In
Partial Fulfillment of the
Requirements for the Degree
of
Master of Arts in Marine Affairs

University of Rhode Island

1985

MASTER OF ARTS THESIS

OF

VICTOR E. DOUGBA

APPROVED:

Thesis Committee

Major Professor

DEAN OF THE GRADUATE SCHOOL

UNIVERSITY OF RHODE ISLAND

1985

ECONOMIC GENUINE LINK: IMPACTS ON LIBERIAN FLAG SHIPPING

BY
VICTOR E. DOUGBA

A Thesis Submitted In
Partial Fulfillment of the
Requirements for the Degree
of
Master of Arts in Marine Affairs

University of Rhode Island

1985

ABSTRACT

Phasing-out of open registries, supported by most developing nations at the United Nations Conference on Trade and Development (UNCTAD), would have triggered a chain reaction among open registries, shipowners, seafarers, and the revenues earned by those supplying shipboard labor. Adherence to the criteria proposed by developing states concerning economic "genuine link" is unsatisfactory to shipowners of developed nations, since it would increase their operating costs. Additionally, if the concept was enforced, it is likely that open registries would have experienced a massive disenrollment.

The application of three techniques, the Chi-Square Statistic, an Index of Seafarer Displacement, and an Index of Revenue Deduction, revealed that Liberian shipowner's representatives responses to hypothetical flag state manning percentage requirements varied. Three potential shipowner options, to go out of business, automate, or reflag, due to higher labor costs were examined to estimate their relative importance. Finally, nations supplying labor to open registries and revenues earned were assessed to determine possible impacts on Liberian bulk shipping.

ACKNOWLEDGEMENTS

I wish to express my heartfelt appreciation to all the members of my thesis committee, who were so instrumental in making my dream a reality. In particular, I am indebted to Dr. Bruce E. Marti for the patience, guidance, and encouragement he rendered when all hopes were gone. Additionally, I am grateful to the Bureau of Maritime of Liberia for sponsoring me and underwriting the cost of this research.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

GENERAL INFORMATION

Introduction

Increased efforts to phase-out open registries in maritime transport have compelled many shipping companies to seek operational alternatives. The array of alternatives include going out of business, increased use of automation, and the reflagging of vessels.

It is the purpose of this study to determine through the application of statistical testing whether or not the phasing out of Flags of Convenience (FOCs), based on a criteria of economic "genuine link", would have a significant impact on: (1) Bulk vessels of the Liberian Registry; (2) seafarers from both high income and low income nations; and (3) revenue generated by some developing nations currently engaged in supplying seafarers to bulk vessels under Liberian Registry.

Statistical testing attempts to discern significant changes among the above sectors; it transcends mere speculations, and provides results which reflect the

reality of a situation. While it is obvious that a changing criteria could have induced restructuring among the above sectors, speculations can not indicate whether significant statistical changes could have occurred. Additionally, statistical testing enables one to accept or reject a hypothesis, while speculations are basically assumptions which may not be correct in fact.

Open Registry Shipping

The question of open registry shipping, which had been stalemated as a result of dissension over the concept of economic "genuine link" in the United Nations Conference on Trade and Development (UNCTAD) deliberations, has been settled. This settlement was realized when major political groups in UNCTAD agreed upon a more liberal policy in July 1985 (Vail, 1985, p. 64).

Advocates of open shipping maintain that the adopted policy will have no real impact on open registry activities (Vail, 1985, p. 64). Prior to agreement, some developing nations demanded an inflexible policy (MacKay, 1985, p. 4) Such a policy could have been binding in a convention known as the United Nations Conference on the Conditions for the Registration of

Ships. The next meeting of this conference is slated for January 1986. At that time, it will decide on the character of the proposed agreement; whether it will be a convention with contractual obligations, or provide provisions which states are free to incorporate into their national legislation at their discretion (Dixit, 1985, p. 1).

Observers allege that the inflexible policy regarding economic "genuine link" could significantly impact significantly maritime transport costs, crew costs, and revenues generated by some developing nations presently engaged in the supply of seafarers to open registry shipping. The concept of economic "genuine link" could cause shipowners to go out of business, automate and/or reflag their ships. A ship is any self-propelled seagoing vessel used for international transport of goods, passengers, or both with the exception of vessels of less than 500 gross registered tons (grt) (TD/RS/Conf. 1.4 1985).

Economic "genuine link" could have damaging impacts, on the Liberian economy. Liberia has the largest open registry fleet, the majority which has been built over the past three decades (Liberian Shipowners' Council, 1985).

Although Liberia is a member of UNCTAD, it is unlikely that it would have incorporated any of the economic "genuine link" features into its national law. The enforcement of the economic "genuine link" concept in Liberia could have resulted in: (1) an en masse repatriation of foreign vessels currently flying its flag (particularly bulkers), (2) an en masse repatriation of foreign seafarers currently employed on these vessels, and (3) a gross reduction in revenues generated by these foreign seafarers. The word seafarer refers to ratings (unlicensed) and officers (licensed) and shall be used interchangeably with crew and seamen.

This research attempts to determine whether Liberia's adherence to the policy regarding the concept of economic "genuine link" could impacted on:

1. Bulk companies of the Liberian Registry; that is whether there would have been a significant difference in their response to go out of business, automate and/or reflag their vessels.
2. Seafarers from both high and low income nations currently employed on bulk vessels of the Liberian Registry.
3. Revenue generated by seafarers from developing nations presently engaged in the supply of labor to bulk companies of the Liberian Registry.

This study is divided into six chapters. The first presents an evolution and application of the concept of "genuine link", a historical review of events leading to the convening of the United Nations Conference on the Conditions for the Registration of Ships, delimitations and justification for the study, and related literature. The second deals with hypotheses and methodologies. The third chapter deals with the aftermath of the criteria of economic "genuine link" on bulk companies. The fourth reviews with the consequences it would have had on seafarers from both high and low income nations presently engaged in the supply of seafarers. The fifth deals with impact on revenues generated by seafarers from developing nations. The sixth presents a summary and conclusions.

The Evolution of the Concept of Economic Genuine Link

The concept of economic "genuine link," which was initially incorporated in the 1958 convention in a context unrelated to shipping, has received enormous attention in recent times. McConnell (1985, p. 369) stated that the phrase "genuine link" entered the international legal scene in 1955 when the International Court of Justice (ICJ) rendered a decision in the Nottebohm case (Liechtenstein vs. Guatemala). In 1939,

K. Nottebohm, a German national, obtained naturalization from Liechtenstein. From 1905 to 1939, Nottebohm had been a resident of Guatemala, but had resided in Liechtenstein three weeks prior to naturalization. During World War II, he had interned in Liechtenstein and remained there until his death. In 1951, Liechtenstein sponsored a claim for compensation (property acquired in Guatemala) on his behalf. The ICJ ruled that although Liechtenstein, as a sovereign state, has the right to grant nationality on whatever basis it chooses, its doing so did not create obligations beyond its boundaries. The Court's rationale was based on the fact there was no "genuine link" between Liechtenstein and Nottebohm. Therefore, Liechtenstein did not have any legitimate claim against Guatemala. Between 1950 and 1955, the International Law Commission (ILC) was preparing provisions for submission to the 1958 United Nations Convention on the High Seas. Prior to the 1958 Convention attempts had been made by the ILC to draft provisions regulating conditions for the granting of nationality, the flag being evidence of registry. Former draft provisions had emphasized economic considerations (Moore, 1979, p. 69). The ILC ran into problems trying to reconcile various national

requirements in order to determine what were internationally accepted standards (Goldie, 1963, p. 220).

Following the Nottebohm decision in 1956, the United Kingdom and the Netherlands submitted draft provisions, both which reflected the economic "genuine link" concept (McConnell, 1985, p. 372). The Dutch proposal used the economic "genuine link" example, while the British proposal emphasized effective jurisdiction and control (McConnell, 1985, p. 374). The Dutch proposal after adjustment, was incorporated in the 1958 United Nations Convention on the High Seas as Article 5. It read thus:

> each state shall fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag. Ships have the nationality of the state whose flag they are entitled to fly. There must be a genuine link between the state and ship; in particular, the state must effectively exercise its jurisdiction and control in administrative and technical and social matters over ships flying its flag.

Because of the failure of Article 5 to address more fully the concept of economic "genuine link", it was re-introduced in Articles 91 and 94 of the 1982 United Nations Convention on the Law of the Sea with little alteration (McConnell, 1985, p. 375). For example, Article 91 of the 1982 Convention, "the Nationality of Ships" duplicates Article 5 of the 1958 Convention, with

one exception. The phrase beginning "in particular" of the 1958 Convention was dropped so that it read:

> every state shall fix the conditions for the grant of nationality to ships for the registration of ships in its territory, and the ships to fly its flag. Ships have the nationality of the state whose flag they are entitled to fly. There must exist a genuine link between the state and the ship.

Unlike Article 5 of the 1958 Convention and Article 91 of the 1982 Convention, Article 94 sets forth the duties which must be undertaken by a flag state to effectively exercise jurisdiction and control in administrative, technical, and social matters over ships flying its flag. Subsequently, it states that flag states are required to take the measures necessary to ensure safety at sea including the manning of ships, labor conditions, the training of crews, the construction of ships, shipboard equipment and vessel seaworthiness, the use of signals, the maintenance of communications, and the prevention of collisions.

Both conventions received an enormous amount of criticism because of what observers called textual ambiguities which are sometimes the legacies of most international agreements. For example, the 1982 convention, which was meant to be more precise in the delimitation of state and ship responsibilities, did not address the elements of ownership, crew, and management

in a satisfactory manner (Liberian Shipowners' Council, 1985). Because of this failure on the part of both conventions to adequately address the concept of economic "genuine link," some political groups, particularly developing nations in UNCTAD, have been persistent in their attacks against the open registry system. The basis for their attacks are: (1) open registry shipping hampers the development of national fleets of developing nations; (2) there is presently no economic "genuine link" between the flag state (a flag state is a state whose flag a ship flies and the ship), and (3) developing nations have not equitably participated in world shipping as providers of world shipping services. Developing nations, which accounted for over 50 percent of the world's exports and generated about 40 percent of the world's trade by weight, have a share in world shipping tonnage of only 15.5 percent (UNCTAD Bulletin, 1985, p. 1).

The importance of open registry shipping can not be contradicted since it accounts for more than 30 percent of the world fleet (Dixit, 1985, p. 1). Open registries are provided by mostly developing nations, and are used primarily by developed nations, which fly such flags to avoid heavy taxation and strict regulations concerning crews (Steigeler and Thomas, 1976, p. 139).

The Rochdale Report of 1970 identified six features common among the open registries:

1. The country of registry allows ownership and/or control of its merchant vessels by non-citizens.
2. Access to the registry is easy. A ship may usually be registered at a consul's office abroad. Equally important, transfer from the registry at the owner's option is not restricted.
3. Taxes on the income from the ships are not levied locally or are low. A registration fee and annual fee, based on tonnage, are normally the only charges made. A guarantee or acceptable understanding regarding future freedom from taxation may also be given.
4. The country of registry is a small power without a national requirement, under any foreseeable circumstances, since shipping charges on a large tonnage may produce a substantial effect on its national income and balance of payments.
5. Manning of ships by non-nationals is freely permitted.

6. The country of registry has neither the power nor the administrative machinery to effectively impose any government or international regulations; nor has the country the wish or the power to control the companies themselves (TD/B/c.4/168,1970).

A review of the historical development of the open registry is illustrated in Figure 1. Even though a number of countries are listed in Figure 1, only Liberia, Panama, Cyprus and to a lesser extent Bermuda are still of importance (Dixit, 1985, p. 2). In recent years, other countries have come to offer open registry facilities. They include Bahamas, Sri Lanka and Vanuatu (Vail, 1985, p. 65).

The reasons for utilizing an open registry are complex and vary with specific circumstances. For example, a Greek shipowner may be seeking personal tax advantages, a major U.S. oil company may want the flexibility in operation and crew services, an owner in an unstable territory might want a neutral country, or a Scandinavian owner may select an open registry to overcome manpower shortages and high wages (Economic Impact, 1979, p. 1).

FIGURE 1

HISTORY OF OPEN REGISTRY

PERIOD	FLAG OF REGISTRY	MOTIVATION
16th Century	Spanish	English merchants circumvented restrictions limiting non-Spanish vessels from West Indies trade.
17th Century	French	English fishermen in Newfoundland used English registry as a means to continue operation in conjunction with British registry fishing boat.
19th Century	Norwegian	British trawler owners changed registry to fish off Moray Firth.
Napoleonic Wars	German	English shipowners changed registry to avoid the French Blockade.
War of 1812	Portuguese	U.S. Shipowners in Massachusetts changed registry to avoid capture by the British.
1922	Panamanian	Two ships of the United American Lines changed from U.S. Registry to avoid laws on serving alcoholic beverages aboard U.S. Ships.
1920-1930	Panamanian Honduran	U.S. shipowners switched registry to reduce operating costs by employing cheaper shipboard labor.

FIGURE 1

HISTORY OF OPEN REGISTRY

PERIOD	FLAG OF REGISTRY	MOTIVATION
1930s	Panamanian	With encouragement from the U.S. Government shipowners switched to Panamanian registry to assist the Allies without violating the Neutrality Laws. European shipowners also switched it to Panamanian registry to avoid wartime requisitioning of their vessels.
1939-1941	Panamanian	Shipowners with German-registered ships switched to Panamanian registry to avoid possible seizure.
1946-1949	Panamanian	More than 150 ships sold under the U.S. Merchant Sales Act of 1946 were registered in Panama - as it offered liberal registration and taxation advantages.
1949	Liberian	Low registration fees, absence of Liberian taxes, absence of operating and crewing restrictions made registry economically attractive.
1950-late 1970s	Liberian Panamanian Honduran Costa Rican San Marinese Sierra Leonean Lebanese Cypriot Hatian Somalian Omani Manxman and others	As the registry in U.S. and other countries become increasingly uneconomical, many countries competed for ship registrations, recognizing the economic benefict to the host flag country; only a few succeeded in attracting significant registrations.

Source: Economic Impact of Open Registry Shipping

Historical Background of UNCTAD Conference on the Conditions for the Registration of Ships

According to TD/RS/Conf. 10/, 1985, the genesis of the United Nations Conference on the Conditions for the Registration of Ships can be traced to August 1974, when the UNCTAD Committee on Shipping unanimously adopted Resolution 22 (VI) on economic cooperation in merchant shipping. It read:

> The Committee on Shipping considers further that the following matters of shipping policy may also be suitable and ripe for harmonization; the economic consequences for international shipping of the existence or lack of a genuine link between vessels and flag or registry as explicitly defined in international convention in force, and requests the UNCTAD Secretariat to undertake an examination of this matter as soon as possible.

Pursuant to this resolution, the UNCTAD Secretariat prepared a report entitled "Economic Consequences of the Existence or Lack of a Genuine Link between Vessel and Flag of Registry (TD/B/C.4/168). This report analyzed the economic considerations as well as the legal aspects of the economic "genuine link," and included a comparison of the economic features of the open registry system, on one hand, and of national flag systems, on the other. The report further concluded that: 1) the expansion of open registry fleets had adversely affected

the development and competitiveness of fleets of countries including developing countries, which did not offer open registry facilities, and 2) certain elements were normally relevant to the establishment of a genuine link between a vessel and its country of registry. These elements in particular are related to the contribution of the merchant fleets to the national economy of the country, the employment of nationals of the country on vessels, and the beneficial ownership of the vessel.

In view of the complexity and importance of the issues raised in the UNCTAD Secretariat report, the Committee on Shipping on April 22, 1977, adopted Decision 33 (VIII) which called for the convening of an ad hoc intergovernmental working group to consider the issues. The working group, at its first session in February 1978, adopted a unanimous resolution stating that "the expansion of an open registry fleet has adversely affected the development and competitiveness of fleets of developing nations and other non-open registry nations." The Report of the first session's working group was submitted at the fifth session of UNCTAD in Manila, in May 1979. After considering the open registry issue, the Conference (UNCTAD) adopted Resolution 120 (v) by majority vote. This resolution took note of the desire of many countries to phase-out

open registry shipping, and requested further studies in respect of the repercussion of phasing-out open registries as well as regarding the feasibility of establishing a legal mechanism for regulating the operations of open registry fleets during the phase-out period.

In January 1980, an ad hoc working group accordingly held its second session. At that time, it could not reach agreement on the question of phasing-out open registry operations, and the matter was referred back to UNCTAD Committee on Shipping. The Committee on Shipping in 1980 adopted a resolution 41 (IX) to hold a special session devoted entirely to the open registry question.

At this special session which took place in 1981, the Committee on Shipping adopted Resolution 43 (S-III) by majority vote, recommending the convening of a Conference of Plenipotentiaries to consider the adoption of an international agreement on conditions for the Registration of Ships. The resolution also recommended the convening of a Intergovernmental Preparatory Group (IPG). The IPG was to be responsible for proposing a set of basic principles concerning the conditions governing which vessels should be on a national shipping register. The principles should apply to (1) manning of vessels, (2) the role of flag state in the management of shipowning companies and vessels, (3) equity

participation in capital, and 4) identification and accountability of owners and operators.

The United Nations General Assembly, in its Resolution 37/200, which was unanimously adopted on December 20, 1982, decided that the proposed Conference should be convened in 1984. The Resolution further requested that the Secretary General of UNCTAD circulate to governments for comments the set of principles drafted by the IPG. In 1983, the Preparatory Committee discussed the set of basic principles which the IPG had adopted. It subsequently decided that it had sufficiently advanced its work for it to be used as a basis for the holding of a plenipotentiary conference.

The United Nations Conference on the Conditions for the Registration of Ships was accordingly convened at the Palais des Nations on July 16, 1984. Another session was held in January-February 1985. Both of these sessions ended in a deadlock because of disagreement among major political groups in UNCTAD over the key issues of manning, management, and ownership of vessels.

Even though both sessions of UNCTAD ended in a deadlock, it is believed that the third session which was convened in July 1985 was a success. The success has been attributed to the replacement of the spokesman representing the developing economies in UNCTAD, and the

role of the Soviets in reconciling the tension among the political groups at UNCTAD (Vail, 1985, p. 64).

Regarding the concept of economic "genuine link", there are presently four main political groups in UNCTAD: (1) the Group of 77 including the People's Republic of China (PRC), and excluding those developing nations offering open registry facilities, (2) Group B, mainly western developed nations, (3) Group D, the Soviet Union and its allies, and (4) the open registry nations.

Davies (1984, p. 45) indicates that in terms of principle regarding economic "genuine link", there has been a huge gulf between the position taken by western developed nations (Group B) and other political groups which include: the Group of 77, and the PRC, and Group D.

Basically, Group B nations wish to have "guidelines" rather than a convention by leaving many of the principles to national legislation. At the same time they want to ensure minimum involvement by the International Labor Organization (ILO) and International Maritime Organization (IMO). The Group of 77 and the Peoples Republic of China desire to see more exacting and legally binding requirements (Liberian Shipowners' Council, 1985). One of the cardinal exacting requirements advanced by developing nations and the PRC

was the percentage of native seafarers to be employed on vessels. According to TD/RS/Conf/PC/3,1983, most developing nations proposed that a significant percentage of key officers and seafarers should be nationals of the flag state.

According to the old proposed text, every state shall:

1. effectively exercise its jurisdiction and control in administration technical and social matters over ships flying its flag;
2. ensure on ships flying its flag that a significant percentage of key officers and of crew (seafarers) are its nationals and determined this percentage in accordance with its law and regulations;
3. ensure that company establishes a management office in its territory before ships owned by that company is accepted on its register in accordance with its law and regulations;
4. ensure that ships flyings its flags will be surveyed by its authorized surveyor in order to ensure compliance with generally accepted international rules and standards;

5. ensure that the person or persons accountable for the management and operations of ships flying its flag are able to perform obligations they may arise from the operations of such ship; and,
6. ensure that a company owning ships flying its flag is incorporated within its territory and that there is adequate national participation in the equity of such company. The level of national participation in the equity is to be determined by its law or regulations (TD/RS/Cong/10/Add.1, 1984).

UNCTAD's third session of the Convention on the Condition for the Registration of Ships, which was held in July, 1985, reached a consensus on the issue of economic "genuine link". The following criteria were applied:

1. The state of registration shall ensure that a satisfactory part of the crew are its nationals, while taking into account the availability of qualified seafares within its territory.
2. A flag state shall exercise its law and regulations for the ownership of vessels flying its flag.

3. The state of registration shall ensure that the shipowning company or a subsidiary shipowning company is established within its territory in accordance with its laws and regulations before ships are accepted in its registry.
4. The state of registration shall enter in its register of ships inter alia, information concerning the ship and its owner or owners.
5. States shall establish a register of ships flying its flag, and the register shall be maintained in a management determined by the state in conformity with the relevant provision of this agreement (TD/RS/Conf/15/Add.1/1985).

It is assumed that the debate over the criteria of economic "genuine link" could have resulted in endless sessions of deliberations at UNCTAD. If such were applied against present shipping institutions it is likely that:

1. It would have effectively prohibited countries such as Saudi Arabia from having a national flag fleet.
2. It would have been disadvantageous to countries with an excess supply of labor (seafarers) and their attempts to find them employment on foreign flag ships.

3. It would have effectively removed from a nation's or company's prerogative the right to choose the best management available.
4. It would have restricted the right of nations or companies from choosing the most effective location for their headquarters or center of operational control.
5. It would have been irrelevant if the purpose of the requirements were to ensure adequate "control" of its flag vessels.
6. It would have effectively prohibited a nation from developing a fleet until it had the national expertise (Miller, 1984, p. 4).

Liberia which is aligned with Group B nations, regarding the debate over economic "genuine link," is opposed to the views of the Group of 77. Liberia believes that if the concept economic "genuine link" was adopted it would have had a severe impact on its national income by reducing the number of vessels currently flying its flag. In 1984, Liberia had about 1,993 vessel (mostly bulkers) owned by approximately 85 companies in the United States, Japan, Germany, and other developed states (see Table 1 and Appendix A). Of the total number of ships, dry bulk vessels accounted for 42 percent, oil tankers 24.7 percent, and dry cargo vessels 9.8 percent.

TABLE 1

LIBERIAN REGISTERED VESSELS ACCORDING TO SHIP TYPE

1984

TYPE	NUMBER OF VESSELS	PERCENT
Bulk Carrier	759	38.0
Oil Tanker	494	24.7
Dry Cargo	196	9.8
Chemical Tanker	103	5.1
Oil/Bulk/Ore Carrier	82	4.0
Supply Vessel	66	3.3
Vehicle Carrier	61	3.0
Container Ship	50	2.5
Liquified Gas Tanker	49	2.5
Drill Rig	46	2.3
Tanker Barge	25	1.2
Oil Barge	13	0.65
Yacht	12	0.60
Tug	9	0.40
Passenger	8	0.40
Landing Craft	3	0.15
Ferry	3	0.15

TABLE 1 (CONTINUED)

LIBERIAN REGISTERED VESSELS ACCORDING TO SHIP TYPE

1984

TYPE	NUMBER OF VESSELS	PERCENT
Crane	3	0.15
Asphalt/Bituman Carrier	2	0.10
Survey Ship	2	0.10
TOTAL ACTIVE VESSELS	1,993	100.00

SOURCE: Bureau of Maritime of Liberia, 1985.

The evolution of open registry activities in Liberia can be associated with Stettinius Associates of New York, who having secured a flexible concession for the development of the Liberian economy, arranged the formalities for granting Liberian registration to foreign ships in 1948 (Boczek, 1962, p. 13). Since 1948, even though the number of ships has fluctuated, Liberia remains an important nation for open registry activities.

Delimitations and Justification for the Study

This research is limited to (1) bulk vessels of the Liberian Registry and (2) the issue of manning.

Several reasons for limiting this research to bulk vessels follow. Bulkers including OBOs accounted of 42 percent of all vessels registered under the Liberian Flag (see Table 1). These 841 vessels accounted for about 65 percent of Liberia's 66.8 million gross registered tons and generated approximately 6 million dollars annually to the Liberian economy (Annual Report of the Ministry of Finance of Liberia, 1984). Secondly, information regarding the operation of bulkers is easily obtained as opposed to that of other ship types. For example, information on the operation of oil tankers, which rank second to bulkers (Table 1), are not easily

accessible because of the lack of coordination between the owners of most oil tankers and the Liberian Registry. Stiegeler (1985, p. 42) defines a bulk vessel as a ship designed specifically to carry a particular dry bulk cargo (ore, coal, grain, etc) which is generally homogenous, relatively low in value, and capable of being loaded by gravity.

Although the concept of economic "genuine link" encompasses manning, ownership and management of vessels; manning, has become the greatest area of contention. Most developing nations have argued that open registry shipping has used its manning requirements to obtain a competitive edge over traditional maritime powers. For example Britain is no longer able to supply the domestic labor required by its national registries (UNCTAD Bulletin, 1985, p. 1). Developing nations, many of which have relatively abundant labor and low wage levels, are thus potentially well placed to increase their share in world shipping business. Developing nations maintain that their competitive advantage, however, is impaired by the open registry countries which offer registration facilities and the right to fly their flag to foreign shipowners for the payment of relatively small fees. Furthemore, there is no requirement that nationals of the flag state be involved in ownership, operation, and manning of vessels. On the

other hand, shipowners of traditional maritime powers have abandoned their flags for open registry flags, and accordingly amassed higher profits resulting from the availability of cheap labor and the unrestricted policy of crew selection (UNCTAD Bulletin, 1985, p. 1-2). Open registry operators have a cost advantage from lower labor costs over national flag operators, and labor costs normally account for about 40 to 50 percent of the operating cost of a vessel (Economist Intelligence Unit, 1979, p. 21).

Review of Relevant Literature

In spite of the fact that the concept of economic "genuine link" has received much attention over the years, an examination of standard sources did not reveal many studies specifically related to the topic of this thesis.

Related Studies

The Economic Impact of Open Registry Shipping, a study undertaken by the Bureau of Maritime of Liberia in conjunction with International Maritime Associates, examines: (1) the nature of Open Registry Shipping; (2) its evolution; (3) its attractiveness; (4) the revenues

generated by some developing nations; (5) its impact of international transportation; (6) transport costs and market competitiveness; and (7) the employment of seafaring personnel. The above study has been widely used as a guide by renown international organizations, including: UNCTAD, Lloyd's Register of London, (Liberian Shipowner's Council, 1985).

The Economist Intelligence Unit publication, which reflects almost the same facts presented as The Economic Impact of Open Registry Shipping, additionally discusses: (1) the impetus for the developing nations' attempts to limit open registry shipping (2) open registry and bulk shipping, (3) the redeployment of bulk vessels; and (4) some economic issues; especially from the point of view of different categories of developing nations.

Dr. Boleslaw Boczek's Flags of Convenience and International Legal Study presents the first comprehensive discussion of the problem of Flags of Convenience (Open Registries). It outlines the origin and the growth of the practice of various open registry fleets, and gives the reasons shipowners have deserted their national flags for open registries.

McConnell's "Darkening Confusion Mounted Upon Darkening Confusion," even though it is restricted to a particular topic (genuine link) proved to be helpful

because it provided an objective approach toward understanding both developing and developed nations' viewpoints regarding the issue of "genuine link".

Methodological Studies

Taylor's analysis of land use classes expands on the Chi-Square (X2) Two Sample Test which is a statistical test that is widely used in the behavioral sciences to measure the discrepancy between observed and expected frequencies. It tests whether a significant difference exists between upland and valley in terms of land use (Taylor, 1977, p. 124-125). Even though Taylor's work uses two samples (valley and upland) this research expands upon his analysis by using four samples (25%, 50%, 75% and 100%) to test whether a significant difference would have existed among these percentages with regard to responses (Yes, No, or No Response) by bulk company representatives to go out of business, automate and or reflag their vessels.

Like Taylor's analysis, Resnick Commodities Flow From Developing to Developed Nations, examines the flow of raw materials (iron ore, grain, coal) on an expected and observed basis (but Resnick refers to the observed variable as actual). It attempts to compare the expected and actual flows of materials from 1969 to

1979, and to test whether or not there was a significant statistical difference between the flows of these materials. This research modifies Resnick's work in an to meet the requirement of the hypothesis testing. It compares the actual number of seafarers, which reflects the present number of seafarers of both high income and low income nations, to the expected number of seafarers, the result of the survey. It was additionally used to compare actual revenues and the expected revenues generated by seafarers from developing nations. In the modification process, substitutions were made, which are explained in the analysis section of this research.

Last but not the least were UNCTAD publications which inspired the general framework of this research. They provided pertinent data and literature which were very useful throughout this writing.

CHAPTER TWO

HYPOTHESES AND METHODOLOGIES

Hypotheses

Earlier research, conducted by the Bureau of Maritime of Liberia (1979, p. 22), hypothesized that phasing-out open registries would have impacted on: (1) trading partners (bilateral and multilateral traders); (2) open registry nations; and (3) and countries providing ancillary services (labor supply and ship repairs). While the above hypotheses were substantial, this research further hypothesized that:

1. As the required crew proportion of nationals of flag states increases from 25-100 percent, there would be a significant increase in the response of shipowners to go out of business, automate and/or reflag their vessels.
2. As the required crew proportion of nationals of flag states increases from 25-100 percent, there would be a greater difference between the real

and projected number of seafarers from both high income and low income nations.

3. As the required crew proportion of nationals of flag state would have increased from 25-100 percent, there would have been a greater difference between the real and projected revenues generated by seafarers from developing nations.

The phase-out criteria of economic "genuine link" does not indicate a specific percentage crew requirement for nationals of the flag state (TD/RS/Conf.1.4, 1985).

The first hypothesis suggests three possibilities (to go out business, automate, and/or reflag vessels), which could be adopted by bulk companies, if either a 25 percent, 50 percent, 75 percent or 100 percent criteria were applied against shipping institutions. Even though the second hypothesis takes into account the 25-100 percent proportion, it deals with only the real and projected number of seafarers. The real or actual number represents the current number of seafarers employed on bulk vessels, while the projected or expected represents the results of the survey instrument. Like the second hypothesis, the third hypothesis tends to reflect the real and projected phenomenon, and it differs because it examines revenue.

The Sample

A sample is a subset of a population, while a population is a complete and entire collection of elements, scores, people, measurements, etc. Triola (1981, p. 3) suggests that one advantage of selecting a sample from a population is that each member of the population has an equal chance of being included in the sample, however a disadvantage is that some major members inadvertantly could be omitted.

The samples for this study were selected from three sets of data:

1. The first sample, which consisted of bulk companies using Liberian registered vessels, was obtained by assigning random numbers to more than 50 bulk companies currently engaged in bulk shipping; out of which 30 were selected. See Appendix B for the selection.
2. The second sample, which consisted of officers and ratings, was obtained by computing the mean per capita income of 30 nations currently supplying labor to the bulk companies of the Liberian Registry. Any nation with less than the mean was considered to be a low income

country, while those nations exceeding the mean were considered to be high income countries (See Appendix C).

3. The third sample, which pertained to revenue generated by labor from developing nations, was obtained by assigning random numbers to 50 developing nations, out of which 30 were selected (see Appendix D for the selection).

Data

The data used in this research were obtained from two main sources: (1) the Bureau of Maritime of Liberia; and (2) a survey conducted on bulk companies of the Liberian Registry. The Bureau of Maritime of Liberia provided both the real or actual number of seafarers by high income and low income developing nations, and revenues generated by seafarers from developing nations.

A survey of bulk companies provided both the projected or expected number of seafarers and revenues. It additionally provided the responses of shipowner representatives with regard to their intention to go out of business, automation and/or reflag their vessels.

Methodologies and Procedures

The hypotheses were tested in accordance with the following two statistical methods:

1. Chi-Square, and
2. Indices of Seafarer Displacement and Revenue Deduction.

The Chi-Square statistical method suggested by Taylor (1977, pp. 124-125) is illustrated as follows:

$$X2 = \Sigma ij \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where

X2 represents the Chi-Square

O_{ij} represents the observed frequencies

E_{ij} represents the expected frequencies

Σij represents the summation.

The subscripts (i) and (j) represent rows and columns respectively.

The following steps were needed to calculate the Chi-Square:

1. The first step was to arrange the frequencies obtained from the investigation into contingency tables (matricies or frequencies) depicting the observed frequencies and the expected

frequencies. The information for each member of the observed frequencies was gained from the survey instrument, while each member of the expected frequencies was obtained by multiplying the total frequencies in each column of the observed frequencies by the total frequencies in each row; the result was divided by the total frequencies from the table or matrix of the observed frequencies.

2. The second step was to obtain the degrees of freedom (df), which was accomplished by subtracting 1 from the total number of rows, and 1 from the total number of columns, the results of the subtraction were multiplied. For example if a contingency table had 4 rows and 3 columns, when 1 was subtracted from both, the results were 3 and 2 respectively; when multiplied the df was 6.
3. The third step was to select the level of significance; the level of significance for this test was .Ø5, which meant that there was a 5 percent chance for the hypothesis to be accepted when it was false.

4. The fourth step was to locate the Chi-Square table value, which was found in Appendix E. This value was obtained by establishing a point of intersection between the df and the level of significance. For example if one has a df of 6 and the level of significance was .Ø5, the result from the Chi-Square table was 1.64.
5. The fifth step was to reject the hypothesis if the experimental Chi-Square value was greater than the Chi-Square table value. For example if the experimental Chi-Square value was 3Ø and the Chi-Square table value was 1.64, the hypothesis was rejected.

The second method is derived from the Index of Commodity Flow (ICF) which was expanded upon by Resnick (1982, p. 82) to assess the flows of commodities from developing to developed nations. It is modified to satisfy our research requirement. In its original form it was stated as follows:

$$ICF_{ij} = \frac{(A_{ij} - E_{ij})^2}{A_{ij} + E_{ij}}$$

Where,

ICF_{ij} represents the Index of Commodity Flow from developing to developed nations

A_{ij} represents actual tons of export

E_{ij} represents the expected tons of export.

The subscripts (i) and (j) respectively represent the initial year and the terminal year. An index, according to Spiegel (1961, p. 313), is a statistical measure designed to show changes in a variable or group of related variables with respect to geographic location or other characteristic such as income, profession, etc.

In modifing the ICF, this research makes two substitutions. The first is the substitution of the ICF by an Index of Seafarers Displacement (IDS), which attempts to assess seafarers from both high income and low income nations. It is illustrated as follows:

$$ISD_{ij} = \frac{(A_{ij} - E_{ij})^2}{A_{ij} + Eij}$$

Where

ISD_{ij}	represents the Index of Seafarers Displacement
A_{ij}	represents the actual frequencies
A_{ij1}	represents the actual number of seafarers from high income nations
A_{ij2}	represents the actual number of seafarers from low income nations
E_{ij}	represents the expected frequencies
E_{ij1}	represents the expected number of seafarers from high income nations
E_{ij2}	represents the expected number of seafarers from low income nations.

The subscripts (i) and (j) represent before and after respectively (before and after the criteria of "genuine link" was applied).

The second application, which analyzes revenues generated by seafarers from developing nations is a substitution of the ICF by an Index of Revenue Deduction (IRD). The formula follows:

$$IRD_{ij} = \frac{(A_{ij} - E_{ij})^2}{A_{ij} + E_{ij}}$$

Where

IRD	represents the Index of Revenue Displacement
A_{ij}	represents actual revenue generated by seafarers from developing nations
E_{ij}	represents expected revenue generated by seafarers from developing nations.

If an ISD or IRD value is positive, it meant that the actual frequencies exceeded the expected, while a negative value represented the inverse. Also if an IRD value was zero, there was no difference between the actual and expected flow. Accordingly, if an IRD value was close to zero, it revealed that no substantial deviation had occurred between the actual and expected frequencies.

CHAPTER THREE

IMPACT ON BULK COMPANIES

Introduction

As hypothesized earlier, shipowners could have resorted to several possibilities: to go out of business, automate, and/or reflag, as a result of compliance with the concept of economic "genuine link" and the subsequent enforcement of same by the Liberian Government. Although Liberia's adherence to this mandate could have encouraged these possibilities, it is necessary to take into consideration the political climate of the state of registry in the absence of a binding convention (Weeks, 1981, p. xii). An article which appeared in the Washington Post (January, 1982, p. 3) entitled, "Liberia's Registry at a Crossroads", reported that there was a gradual decline in Liberia's fleet size since the 1980 overthrow of the government.

Because the UNCTAD Third Conference on Conditions for the Registration of Ships did not indicate a specific percentage of seafarers to be nationals of flag state, this research assumed that possible percentages would have been either: 25 percent, 50 percent, 75 percent or 100 percent. Based on these percentages, administrators of 30 bulk companies utilizing the Liberian registry were interviewed, and asked to identify company intentions, if any, should the above percentages be adopted. These percentages were applied against three possibilities: to go out of business, automate, and/or reflag their vessels. In addition, to test whether there would have been a significant difference among these percentages with regard to their responses (Yes, No, and No Answer), the Chi-Square (X^2) Test suggested by Taylor (1977, p. 124) was applied.

To Go Out of Business

Going out of business means a firm's permanent exit from the market. In this manner fixed costs are avoided. Fixed costs refer to those costs which are determined by a legal contract and do not vary with output (Heibronner and Thurow, 1981, p. 14). Examples of fixed cost are ship insurance and legal fees.

Bulk shipping is faced with increasing crew costs along with a changing political climate in registry states. Furthermore, international bulk shipping is currently in the throes of its most enduring recession since World War II ended some 40 years ago (Clarke, 1984, p. 4). Bulk operators, once noted for their bouyant optimism, have found it increasingly difficult to discern an end to the weak shipping markets for a number of reasons (Loree, 1985, p. 3). One of the principal reasons is that the bulk vessel supply and demand equation is woefully out of balance. In recent times, one and three-quarter tons of tanker tonnage has been available to meet each ton of demand. The present trend in the demand for bulk vessels has been attributed to a hike in the number of bulk vessels during the 1983 oil price upheaval, the low demand for grain on the world market, and the advent of alternate energy resources (Loree, 1985, p. 4).

Table 2 reveals the responses of bulk companies regarding their intention to go out of business if the hypothetical percentages of 25, 50, 75, and 100 were applied. As the proportion increased from 25 percent to 100 percent the number of positive responses (indicated by "Y") rose, while the number of negative responses (indicated by "N") dropped simultaneously. This trend

TABLE 2

THE RESPONSE OF BULK COMPANIES
TO GO OUT OF BUSINESS

COMPANY	PERCENTAGE 25	50	75	100
Africa Camellia Shipping Corporation	Y	Y	Y	Y
Aluminum Company of America	N	Y	Y	Y
Brokerage & Management Corporation	N	Y	Y	Y
Buttercup Shipping	Y	Y	Y	Y
Chemco International Leasing Ltd.	N	Y	Y	Y
Continental Chartering	Y	Y	Y	Y
Conti-Osg Associates'	N	N/A	N/A	N
Exxon International	N	N	N	Y
First Trust Company of St. Paul	N	N	Y	Y
General Ore International Corporation	N	N	N/A	N/A
Global Bulk Carrier Inc.	N	N	N	N
Gogbon Corporation	N	N/A	N/A	N/A
Hilton Carrier	N	N	Y	Y
Hugo Neu Corporation	Y	Y	Y	Y
International Ocean Shipping	Y	Y	Y	Y
International Affiliates	N	Y	Y	Y
Itel Navigation Inc.	N	N	Y	Y
Levin Metal Corporation	N	N	Y	Y
Libmar Five Inc.	N	N	N	N
Marcona Conveyor Corporation	N	Y	Y	Y
Maru Shipping Company	Y	Y	Y	Y
Neptune Bulk Carrier	N	N	N	Y
Ogden Marine Inc.	N	Y	Y	Y
Overseas Shipping Group Inc.	N	Y	Y	Y
Reynold Metal Company	N	Y	Y	Y
Seaboard Flour Corporation	Y	Y	Y	Y
Sintraxx	N	N	N	Y
Skaarup Shipping Corporation	N	N	N	Y
United States Steel Corporation	N	N	N	Y
Utah International Inc.	N	Y	Y	Y

Y represents (yes), N represents (No) and N/A represents No answer.

SOURCE: Author's Survey.

is attributable to the potential acute rise in the percentage of domestic crew employment which is very expensive, as opposed to foreign crews which may be much cheaper.

Out of 30 bulk companies whose views were solicited, Seaboard Flour Corporation, Continental Chartering, Maru Shipping Company, and International Ocean Shipping, indicated that they attached great importance to the employment of foreign crews. An increase in the required percentage of domestic crew employment would therefore have contributed to a significant increase in operating costs. The above companies rank among the top companies with large numbers of bulkers and labor intensive manning.

In contrast, Global Bulk Carrier, and Libmar Five responses were quite negative as the crew proportion increased from 25 to 100 percent, which is attributed to the fact that they have a low dependency on foreign crews, or fewer bulk vessels whose manning does not require a high manpower requirement. See Appendix B for number of ships, number of foreign crew, number of domestic crew, and beneficial ownership of the 30 bulk companies.

The Chi-Square Test enables one to discern whether a significant difference existed among the percentages with regard to the responses of bulk company officials

to go out of business. This test was based on the observed frequencies (Table 3) and the expected frequencies in Table 4. Since each table represents a 4 by 3 matrix, the Chi-Square was calculated as follows:

$$X2 = \Sigma_{ij} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where,

X2 represents the Chi-square

O_{ij} represents the observed frequencies

E_{ij} represents the expected frequencies

Σ_{ij} represents the summation

The subscripts (i) and (j) represent rows and columns respectively.

The mathematics of the Chi-Square of both the observed and expected frequencies is illustrated as follows:

$$\frac{(7 - 17)2}{17} + \frac{(23 - 11.25)2}{11.25} + \frac{(\emptyset - 1.75)2}{1.75} +$$

$$\frac{(16 - 17)2}{17} + \frac{(12 - 11.25)2}{11.25} + \frac{(2 - 1.75)2}{1.75} +$$

$$\frac{(2\emptyset - 17)2}{17} + \frac{(7 - 11.25)2}{11.25} + \frac{(3 - 1.75)2}{1.75} +$$

$$\frac{(25 - 17)2}{17} + \frac{(3 - 11.25)2}{11.25} + \frac{(2 - 1.75)2}{1.75}$$

$$= 31.19$$

TABLE 3

OBSERVED FREQUENCIES OF BULK COMPANIES
WITH REGARD TO GO OUT OF BUSINESS

	RESPONSE			
PERCENTAGE	Yes	No	N/A	Total
25	7	23	0	30
50	16	12	2	30
75	20	7	3	30
100	25	3	2	30
Total	68	45	7	120

N/A represents No Answer

Source: Author's Calculations from survey.

TABLE 4

EXPECTED FREQUENCIES OF BULK COMPANIES WITH REGARD TO GO OUT OF BUSINESS

PERCENTAGE	RESPONSE Yes	No	N/A	Total
25	17	11.25	1.75	30
50	17	11.25	1.75	30
75	17	11.25	1.75	30
100	17	11.25	1.75	30
Total	68	45	7	120

N/A represents No Answer

SOURCE: Author's Calculations.

The research or experimental Chi-Square result pertaining to the responses of the 30 bulk company officials to go out of business was 31.19 at degrees of freedom (previously defined) of 6 at .05 level of significance. The Chi-Square Table value which appears in Appendix E is 1.64. Since the research result was greater than the Table value, it was therefore concluded that most of the 30 bulk companies would have gone out of business if the required proportion of nationals of the flag state would have increased from 25 to 100 percent.

Automation

Automation is defined as a system which automatically controls the operation of an apparatus, process or system by mechanical electronic devices and takes the place of human organs of observation, efforts and decision (Webster, 1983, p. 23). The above does not limit its definition to a specific area, yet for the purpose of this section, automation is limited to: (1) Cargo handling (involving computerized cargo handling techniques), (2) Engine room systems (where the engines of ships are monitored), and (3) Navigation.

The advantages of installing automation on bulk vessels include: (1) it brings about a safer control (instruments are better watchkeepers and react better and quicker than humans); (2) it increases the economies of operation (improved control and technical conditions result in reduced bunkering and lubricating oil consumption and lower repair and spare parts bills); (3) it reduces crew complement (fewer watchkeepers and improved working conditions on board, especially for officers, and includes air conditioning, moisture control and sound proofing).

The disadvantages of automation are: (1) it creates special problems for seafarers in a transition period (owing to a change in the organization and its demands for training); (2) it increases the risk of failure in the automation system; and (3) it encourages boredom by reducing human attention requirements.

In spite of the advantages and disadvantages of automation, Johnson (1985, p. 44) states that the automation of vessels usually precedes their building or requires a special arrangement which demands additional funding. Due to advantages out weighing disadvantages, the current trend is for shipowners to automate. Even though the above situations persist, it is believed that shipowners of bulk companies could have resorted to further automation as a possible alternative.

Table 5 reveals the responses of bulk company officials to employing automation under the hypothetical percentages of 25 percent, 50 percent, 75 percent, or 100 percent. As the required proportion increased from 25 percent to 100 percent, the number of positive responses rose, while the number of negative responses decreased simultaneously. This was probably due to the same reasons stated in the previous section.

The response of the shipowner representatives of Seaboard Flour Corporation, Itel Navigation Incorporated, Chemco International Leasing Limited, Marcona Conveyor Corporation and International Ocean Shipping were consistent from 25 percent to 100 percent. This suggested that these companies have a high potential reliability on the service of foreign crews.

Even though there were no patterns in the negative response category from 25 to 100 percent, those that negatively responded up to 75 percent and positivly responded at 100 percent included: Continental Chartering, Hugo Neu Corporation, Aluminum Company of America, International Affiliates, Exxon International, Gogbon Corporation, and Sintraxx. This suggested that any percentage between 25 and 75 percent would have had little or no impact on them in respect to increasing demployment of automation.

TABLE 5

THE RESPONSE OF BULK COMPANIES
TO AUTOMATION

COMPANY	PERCENTAGE 25	50	75	100
Africa Camellia Shipping Corporation	N/A	N/A	Y	Y
Aluminum Company of America	N	N	N	Y
Brokerage & Management Corporation	N	N	Y	Y
Buttercup Shipping	N	Y	Y	Y
Chemco International Leasing Ltd.	Y	Y	Y	Y
Continental Chartering	N	N	N	Y
Conti-Osg Associates'	N	Y	Y	Y
Exxon International	N	N	N	Y
First Trust Company of St. Paul	N	Y	Y	Y
General Ore International Corporation	N	N	Y	Y
Global Bulk Carrier Inc.	N	N	N	N
Gogbon Corporation	N	N	Y	Y
Hilton Carrier	N	N	N	N/A
Hugo Neu Corporation	N	N	N	Y
International Ocean Shipping	Y	Y	Y	Y
International Affiliates	N	N	N	Y
Itel Navigation Inc.	Y	Y	Y	Y
Levin Metal Corporation	N	Y	Y	Y
Libmar Five Inc.	N	N	Y	Y
Marcona Conveyor Corporation	Y	Y	Y	Y
Maru Shipping Company	N	Y	Y	Y
Neptune Bulk Carrier	N/A	N/A	N/A	N/A
Ogden Marine Inc.	N	N	Y	Y
Overseas Shipping Group Inc.	N	Y	Y	Y
Reynold Metal Company	N	N	Y	Y
Seaboard Flour Corporation	Y	Y	Y	Y
Sintraxx	N	N	N	Y
Skaarup Shipping Corporation	N	N	Y	Y
United States Steel Corporation	N	Y	Y	Y
Utah International Inc.	N	N	Y	Y

Y represents (yes), N represents (No) and Na represents No answer.

SOURCE: Author's Survey.

The Chi-Square result, which was based upon the observed and expected frequencies in Tables 6 and 7, was 30.86. The Table value at a df of 6 was 1.64. Thus, the conclusion was that most shipowners would have automated their bulk vessels as the required proportion of nationals of flag state would have increased from 25 percent to 100 percent.

Reflag

While it is likely that companies would go out of business and/or automate bulk vessels, it is also possible that shipowners could have reflaged their vessels in response to high national manning requirements. Reflagging of vessels refers to the changing of the registration of a vessel from its previous register or flag to a new one.

This research attempted to ascertain whether reflagging could have led to an increased registration of bulk vessels in high income or low income economies. A study undertaken by the Economist Intelligence Unit (1979, p. 43) revealed that most of these companies would have first looked for havens under quasi-open registries common in some developed economies (for example Britain), or disposed of some of their vessels; particularly the older ones, on the second hand or scrap markets. It is unlikely that shipowners would have

TABLE 6

OBSERVED FREQUENCIES OF BULK COMPANIES
WITH REGARD TO AUTOMATION

	RESPONSE			
PERCENTAGE	Yes	No	N/A	Total
25	5	23	2	30
50	12	16	2	30
75	20	9	1	30
100	28	0	2	30
Total	65	48	7	120

N/A represents No Answer

SOURCE: Author's Calculations from survey.

TABLE 7

EXPECTED FREQUENCIES OF BULK COMPANIES WITH REGARD TO AUTOMATION

PERCENTAGE	Yes	No	N/A	Total
25	16.25	12	1.75	30
50	16.25	12	1.75	30
75	16.25	12	1.75	30
100	16.25	12	1.75	30
Total	65	48	7	30

N/A represents no answer

SOURCE: Author's calculations.

reflagged their vessels in developing economies, because this could have encouraged a joint ventures, thereby surrending affective control of their assets. An advantage according to the above study is that cost savings may accrue due to allowances in the hire of foreign crews. Low operating cost would give such vessels an advantage in the charter market. A time charter refers to the engagement of a vessel or vessels by an individual or individuals for a period of time to carry cargo not barred by the contract anywhere within geographic limitations. A bareboat charter refers to the engagement of a vessel or vessels by an individual or individuals by which the owner of the vessels transfer operational control of the ship to the charterer (Kendall, 1983, p. 29).

Similar to the previous results, as the proportion of required nationals increased from 25 to 100 percent, the level of positive responses rose while the level of negative responses dropped simultaneously (Table 8). Unlike the two sections previously analyzed, where there were discernable patterns in the negative and positive responses from 25 percent to 100 percent, the intention to reflag was marked by positive responses from 50 percent to 100 percent and also an undecided responses (indicated by "N/A") from 25 percent to 100 percent.

TABLE 8

THE RESPONSE OF BULK COMPANIES
TO REFLAG

COMPANY	PERCENTAGE 25	50	75	100
Africa Camellia Shipping Corporation	N/A	N/A	N/A	Y
Aluminum Company of America	Y	N/A	Y	Y
Brokerage & Management Corporation	N	N/A	Y	Y
Buttercup Shipping	N	N/A	Y	Y
Chemco International Leasing Ltd.	N/A	N/A	Y	Y
Continental Chartering	N/A	Y	Y	Y
Conti-Osg Associates'	N	Y	Y	Y
Exxon International	N/A	N/A	Y	Y
First Trust Company of St. Paul	N	N/A	N/A	N/A
General Ore International Corporation	N/A	N/A	N	Y
Global Bulk Carrier Inc.	N/A	N/A	N/A	Y
Gogbon Corporation	N/A	N/A	Y	Y
Hilton Carrier	N/A	N/A	N/A	N/A
Hugo Neu Corporation	N/A	N/A	Y	Y
International Ocean Shipping	N	Y	Y	Y
International Affiliates	N/A	Y	N/A	Y
Itel Navigation Inc.	N/A	N	N	Y
Levin Metal Corporation	N/A	N/A	N/A	N/A
Libmar Five Inc.	N/A	N/A	N/A	Y
Marcona Conveyor Corporation	N/A	N	N/A	Y
Maru Shipping Company	N	N	Y	Y
Neptune Bulk Carrier	N/A	N/A	Y	Y
Ogden Marine Inc.	N/A	N/A	Y	Y
Overseas Shipping Group Inc.	N/A	N/A	Y	Y
Reynold Metal Company	N/A	Y	Y	Y
Seaboard Flour Corporation	N/A	N/A	Y	Y
Sintraxx	N/A	N/A	N/A	N/A
Skaarup Shipping Corporation	N/A	N/A	Y	Y
United States Steel Corporation	N	N	Y	Y
Utah International Inc.	N/A	N/A	N	Y

Y represents (yes), N represents (No) and Na represents No answer.

SOURCE: Author's Survey.

Companies whose responses were positively consistent from 50 to 100 percent were: Reynold Metal Company, Continental Chartering, Conti-Osg Associates, and International Ocean Shipping. This trend suggests that these companies would have reflagged their vessels if any percentage above 25 percent were selected.

Companies with undecided responses were: Levin Metal Company of America, Sintraxx, and Hilton Carrier. Undecided responses could be attributed to the belief that some shipowners did not want to reveal their company's prerogatives, and also they could not predict which flag could have been more suitable than the Liberian Flag.

The Chi-Square result, which was based on the observed and expected frequencies in Tables 9 and 10, was 44.40, while the Table Value was 1.64, leading to the conclusion that most shipowners would have reflagged their vessels as the required proportion of nationals increased from 25 to 100 percent.

Several factors besides the change from foreign crews to national crews could have encouraged the possibilities to go out of business, automate and/or reflag. These factors include the political climate in the open registry state, the demand for bulk shipping, and insurance.

TABLE 9

OBSERVED FREQUENCIES OF BULK COMPANIES WITH REGARD TO REFLAG

PERCENTAGE	RESPONSE Yes	No	N/A	Total
25	Ø	8	22	3Ø
5Ø	5	4	21	3Ø
75	18	3	9	3Ø
1ØØ	26	Ø	4	3Ø
Total	49	15	56	12Ø

N/A represents no answer

SOURCE: Author's calculations from survey.

TABLE 10

EXPECTED FREQUENCIES OF BULK COMPANIES WITH REGARD TO REFLAG

	RESPONSE			
PERCENTAGE	Yes	No	N/A	Total
25	12.25	3.75	14	30
50	12.25	3.75	14	30
75	12.25	3.75	14	30
100	12.25	3.75	14	30
Total	49	15	56	120

N/A represents No Answer

SOURCE: Author's calculations.

Summary

The analyses revealed that most bulk companies would not have resorted to any of the three possibilities if a 25 percent national crew requirement was enforced, while at 50 percent, 75 percent or 100 percent national crew requirements proved unfavorable to most bulk shipowners, and could increase their operational costs. Most bulk shipowners could have adopted any of these possibilities if circumstances allowed. The responses of the following bulk company officials showed that they could have been most affected: Seaboard Flour Corporation, International Ocean Shipping, Chemco International Leasing Ltd., Continental Chartering, Reynold Metal Company, Maru Shipping Company, Itel Navigation Incorporated, Conti-Osg Associates and Marco Conveyor Corporation. Almost all of the above bulk companies ranked highest among the users of foreign crews and each had more than 20 bulkers. Bulk companies which could have been least influenced by any of the percentages included: Global Bulk Carrier, Libmar Five, Hugo Neu Corporation, Aluminum Company of America, Exxon International, Gogbon, Sintraxx, Levin Metal Company, Africa Camilla, Skaarup, United States Steel Corporation, and Utah International Incorporated. These companies had fewer bulkers whose manning was not highly influenced by crew size.

The Chi-Square statistic, which was used to analyze the degree of differences in the response of these companies (to go out of business, automation, and/or reflag), showed a 31.19 for going out of business, 30.86 for automation and 44.40 for reflagging. The Table value which was constant for each of the preceeding possibilities was 1.64. Because the Chi-Square results of each possibility were greater than the Table Value, it was therefore concluded that there was a substantial difference in the responses of shipowners as the required proportion of nationals of a flag state increased from 25 percent to 100 percent. There were substantial differences reported for each possibility, the highest were seen in the responses of shipowner to reflagging. This lack of consistent response was attributed to the assumption that most shipowners could not discern at the time of this research which flag could have been a possible alternative to open registries.

Lack of sufficient cargo on the world market has subsequently paralyzed bulk shipping. By going out of business, shipowners could avoid fixed costs. The last but not the least possibility was automation which had a Chi-Square at 30.86, which meant that shipowners would have preferred automation rather than going out of business and reflagging because it could increase the

economies of operation by reducing crew complement and bringing about a safer control.

CHAPTER FOUR

IMPACT ON SEAFARERS

Introduction

Given that bulk companies would have either gone out business, automated and/or reflaged their vessels, each option could have impacted significantly on seafarers from both developed and developing nations.

A recent statistical record, by the Bureau of Maritime of Liberia, indicated that there were about 20,000 seafarers from more than 50 developed and developing nations currently employed on its bulk fleet. Chief suppliers of seafarers include: Taiwan, the Philippines, Great Britain, South Korea, Spain, Greece, and Italy (Bureau of Maritime of Liberia, 1985).

To ascertain whether or not these seafarers could have been affected, this Chapter was concerned with two major divisions. These divisions represented a total of 13,400 seafarers from 30 high and low income nations.

The rationale for these divisions was to discern whether or not there would be significant differences between the actual and expected frequencies of seafarers of high and low income countries. The number of seafarers was supplied by the Liberian Shipowner's Council.

The actual frequencies represented the current number of seafarers from each high or low income nation. The expected frequencies were obtained from a projection made by officials of the Liberian Shipowners' Council that there would be a 67 percent reduction in the total number of seafarers currently employed by bulk companies of the Liberian Registry. This projected percentage was applied against the actual frequency of seafarers of each nation. For example, the actual frequency of seafarers from Spain was 1431, when same was multiplied by .67, the expected frequency was 958.

High Income Nations

Of 3,633 seafarers from 12 high income nations (Table 11), Spain ranked the highest, with a total number of ratings more than three times the total number of officers. This situation reflects the demand for more ratings than officers on bulk vessels.

Following Spain in declining order was Great Britain with a total number of ratings almost equivalent to its

TABLE 11

RATINGS AND OFFICERS OF BULK VESSELS
OF HIGH INCOME NATIONS
1984

COUNTRY	NOR	NOF	TOTAL	RANK
Spain	1081	350	1431	1
Great Britain	492	371	863	2
Japan	311	167	478	3
Norway	83	177	260	4
Germany	79	145	224	5
Netherlands	70	93	163	6
Denmark	49	62	111	7
Sweden	7	33	40	8
France	22	7	29	9
Australia	19	5	24	10
Finland	3	5	8	11
Iceland	1	1	2	12
Total	2217	1416	3633	
Mean			303	

NOR, Number of Ratings; NOF, Number of Officers

SOURCE: Liberian Shipowners Council, 1985.

total number of officers. Japan ranked third with its total number of ratings almost two times the size of its officers. Following Japan in a declining order were: Norway, Germany, the Netherlands, Denmark and Sweden with more officers than ratings, which suggested that these five nations had more trained seafarers (licensed) than ratings unlicensed). France and Australia ranked ninth and tenth respectively with more ratings than officers, followed by Finland with more officers than ratings. Iceland held the last ranking of the 12 nations sampled, with one officer and one rating.

Because of the variation in the absolute numbers of seafarers (see Table 11), it was necessary to sub-divide the 12 nations into categories, reflecting those nations that could have been maximally, intermediately or minimally affected. These subdivisions were obtained by assuming that the maximal category consisted of those developed nations whose total number of seafarers was greater than 10 percent of the sample mean (Table 11). The intermediate category consisted of those developed nations whose total number of seafarers fell between positive and negative 10 percent of the sample mean. Finally, the minimal category consisted of those developed nations whose total number of seafarers was less than 10 percent of the sample mean. Because no

observations occurred in the intermediate category, this research was left with the maximal category (hereafter referred to as Category I) and the minimal category (hereafter referred to as Category II).

Categories I and II

Category I, which included the actual and expected frequencies of seafarers that could have been maximally affected, was represented by Spain, Great Britain, and Japan. These three countries accounted for more than 75 percent of the total number of seafarers (Table 12).

Category II, was represented by 9 high income nations, with Norway ranking the highest and Iceland the lowest (Table 13). Even though Category II comprised 9 nations, as opposed to Category I with 3 nations, it accounted for only 25 percent of the total seafarers from the high income nations.

Grouping the high income nations into Categories I and II was important for the application of the Index of Seafarer Displacement. A positive Index of Seafarers Displacement value meant that the actual frequencies exceeded the expected frequencies, while a negative value meant the inverse. Also, if an Index of Seafarers Displacement value was zero, it meant that no difference

TABLE 12

CATEGORY I
NUMBER OF SEAFARERS OF HIGH INCOME NATIONS

COUNTRY	ACTUAL	EXPECTED	DIFFERENCE
Spain	1431	958	473
Great Britain	863	578	285
Japan	478	320	158
Total	2772	1856	916

SOURCE: Author's calculations.

TABLE 13

CATEGORY II
NUMBER OF SEAFARERS OF HIGH INCOME NATIONS

COUNTRY	ACTUAL	EXPECTED	DIFFERENCE
Norway	260	174	86
Germany	224	150	74
Netherlands	163	109	54
Denmark	111	74	37
Sweden	40	27	13
France	29	19	10
Australia	24	16	8
Finland	8	5	3
Iceland	2	1	1
Total	861	575	286

SOURCE: Author's Calculations.

existed between the actual and expected frequencies. Additionally, it is noted that if an ISD value was closer to zero no substantial variation existed between the expected the actual frequencies.

The calculation of the ISD, required squaring the difference between the total expected and actual frequencies and dividing the result by the sum of the total expected and actual frequencies. For example, the difference between the total expected and actual frequencies in Category I was 916; when squared, the result was 839,Ø56. If the same was divided by the sum of the total expected and actual frequencies which was 4,628, the ISD was 181.29. Accordingly, the ISD was calculated for Category II, which was 56.29 (see Table 14).

Although both categories exhibited a high deviation between their actual and expected frequencies, Category I was much much higher than Category II which can be attributed to the fact that all of the nations in Category I rank among the highest suppliers of labor to bulk vessels under the Liberian Registry, while Category II nations rank among some of the least supplying nations.

TABLE 14

INDEX OF SEAFARERS DISPLACEMENT CALCULATIONS
OF HIGH INCOME NATIONS

CATEGORY	ISD
I	181.29
II	56.96

Low Income Nations

The analysis of seafarers of low income nations basically followed the same form as that for the high income nations. Table 15 reveals that the ranking based upon total number of seafarers mimics that of both ratings and officers, although some nations supplied lesser amounts of officers than ratings. It should be noted that Greece and the USSR are included in the low income nation category. This usage differs from normal internation taxonomies. A per capita sample mean of $4,925.52 exceeded that for Greece ($4,590) and the USSR ($2,600), thus justifying the placement of these two nations in the low income category. This regular trend among seafarers of low income nations was attributed to the high cost associated with training of seafarers, which most low income nations can not afford. According to the Liberian Shipowner (1985), the average cost to train an officer was estimated at $90,000.

Of 9,567 seafarers from 18 low income nations sampled (see Table 15), Greece ranked the highest with total ratings almost twice the size as total officers; followed by China with its total number of officers less than half the size of its ratings. Hong Kong ranked third with a total number of ratings and officers almost the same as China, followed by South Korea with a total

TABLE 15

RATINGS AND OFFICERS OF BULK VESSELS
OF LOW INCOME NATIONS
1984

COUNTRY	NOR	NOF	TOTAL	RANK
Greece	1368	845	2213	1
China	1036	800	1836	2
Hong Kong	1100	702	1802	3
South Korea	1216	483	1699	4
India	799	169	968	5
Indonesia	374	47	421	6
Bangladesh	141	4	145	7
Burma	119	25	144	8
Egypt	82	6	88	9
Chile	177	7	82	10
Colombia	53	8	61	11
Cyprus	32	4	36	12
Jamaica	26	3	29	13
Guatemala	13	1	14	14
Cape Verde	11	1	12	15
Ecuador	10	1	11	16
Algeria	3	0	3	17
USSR	2	1	3	18
Total	5828	3739	9567	
MEAN			638	

NOR, Number of Ratings; NOF, Number of Officers.

SOURCE: Liberian Shipowners' Council, 1985.

seafarers slightly exceeding the size of ratings from Greece. India followed with a total crew almost half the total crew of China, followed by Indonesia, Bangladesh, and Burma ranking sixth, seventh and eighth respectively.

Besides the nations mentioned in the preceding paragraph, the rest of the low income nations supplied less than 200 seafarers. The Soviet Union and Algeria supplied the least of all low income nations. Like the high income nations previously discussed, it was necessary to group the seafarers of the 18 low income nations to reflect which would have been maximally, intermediately or minimally affected. These subdivisions are obtained utilizing the same assumptions used for the high income nations, once again no observations occurred in the intermediate category during the arrangement, thus this research was left with a maximal category (hereafter referred to as Category III) and a minimal category (hereafter referred to as Category IV).

Categories III and IV

Category III, which consisted of the expected and actual frequencies of seafarers that could have been maximally affected, was represented by Greece, which

ranked the highest followed by China, Hong Kong, South Korea and India in a declining order of importance (Table 16).

Category IV (Table 17) included the actual and expected frequencies of seafarers minimally affected and consisted of 25 low income nations with Indonesia, Bangladesh, and Burma ranking as the top three nations, while Algeria and the Soviet Union ranked the least in this category. Even though Category IV consisted of more nations than Category III, the ISD value of Category III was 555, while the ISD value of Category IV was 69.64 (Table 18). This was attributed to the fact that the nations in Category III ranked among the chief suppliers of seafarers, while the latter ranked among the least suppliers of seafarers.

Summary

The analysis of the impact on seafarers was based on two general divisions, the high income nations and the low income nations, which account for 3,633 and 9,567 seafarers respectively. While low income nations were also subdivided into categories III and IV. Category III which accounted for about 90 percent of all seafarers in the low income division, was dominated by Greece, China, Hong Kong, South Korea and India.

TABLE 16

CATEGORY III
NUMBER OF SEAFARERS OF LOW INCOME NATIONS

COUNTRY	ACTUAL	EXPECTED	DIFFERENCE
Greece	2213	1483	730
China	1836	1230	606
Hong Kong	1802	1207	595
South Korea	1699	1138	561
India	968	649	319
Total	8518	5707	2811

Source: Author's calculations.

TABLE 17

CATEGORY IV
NUMBER OF SEAFARERS OF LOW INCOME NATIONS

COUNTRY	ACTUAL	EXPECTED	DIFFERENCE
Indonesia	421	282	139
Bangladesh	145	97	48
Burma	144	96	48
Egypt	88	58	30
Chile	82	55	27
Colombia	61	41	20
Cyprus	36	24	12
Jamaica	29	19	10
Guatamala	14	9	5
Cape Verde	12	8	4
Ecuador	11	7	4
Algeria	3	1	1
USSR	3	2	1
Total	1049	700	349

SOURCE: Author's Calculations.

TABLE 18

INDEX OF SEAFARERS DISPLACEMENT CALCULATIONS
OF LOW INCOME NATIONS

CATEGORY	ISD
III	555
IV	69.64

SOURCE: Author's Calculations.

Category IV which consisted of 13 nations, accounted for less than 10 percent of all seafarers in the low income division. Unlike the high income division, there were more ratings than officers from each low income nations.

The Index of Seafarers Displacement, which was used to detect whether a substantial difference occurred between the actual and expected number of seafarers, revealed that the ISD values for all categories, were statistically significant. Categories I and III, which accounted for slightly over 26 percent of all seafarers sampled, had extremely high ISDs. Because of these high ISD values, it was concluded that only Categories I and III would be appreciably affected, while the Categories II and IV would be slightly affected. The nations in Category I which would highly affected included Spain and Great Britain, while those of Category III include Greece, China, Hong Kong and South Korea.

CHAPTER FIVE

IMPACT ON REVENUE

Introduction

Revenue generated by seafarers from developing nations presently engaged in the supply of seafarers to open registries is vital to some nations and less vital to others. Its importance to some developing nations can be measured in terms of foreign exchange earnings. A previous study indicated that: the supply of seafarers to open registries is an attractive, non-depleting way to generate earnings in hard currency, and relatively little or no investment is required (International Maritime Associates, 1979, p. 25).

Another report by the National Seamen Board, (Annual Report, 1980, p. 86) revealed that the foreign exchange generated by Filipino seafarers amount to approximately $120 million U.S. Dollars in 1979. In addition, Korean seafarers generated about 88 and 100 million U.S. dollars during 1979 and 1980 respectively.

Foreign exchange earnings generated from open registries were less important to countries like Morocco, Algeria, and Trinidad, because they supplied fewer seafarers than others. While it was anticipated that those developing nations which received a substantial amount of revenue could have been adversely affected, this Chapter attempted to analyze the impact on 30 developing nations currently supplying labor to bulk vessels under Liberian Registry.

Table 19 shows that the total revenue generated by seamen from the 30 developing nations sampled was 172.75 million dollars. In decreasing order of importance, Hong Kong, the Philippines, China, South Korea and India were the top five nations, with more than half of the total revenue generated. These same nations ranked highest amongst all of the nations, both developed and developing in supplying seafarers to bulk vessels under the Liberian Registry. Developing nations least involved in supplying seafarers to the Liberian Flag included: Guatamala, Nigeria, Trinidad, Morocco and Algeria. The total foreign exchange earnings of those that provided minimum amounts of labor to Liberian bulk shipping was less than one million dollars.

TABLE 19

REVENUE GENERATED BY SEAFARERS
1984

COUNTRY	AMOUNT (MILLION US $)	RANK
Hong Kong	38.12	1
Philippines	31.60	2
China	29.00	3
South Korea	27.60	4
India	14.10	5
Tawain	10.50	6
Indonesia	5.80	7
Pakistan	3.30	8
Burma	2.10	9
Bangladesh	1.80	10
Chile	1.60	11
Egypt	1.14	12
Colombia	.85	13
Syria	.69	14
Sri Lanka	.61	15
Paraguay	.54	16.5
Singapore	.54	16.5
Jamaica	.39	18
Turkey	.36	19
Uruguay	.34	20
Cape Verde	.27	21
Thailand	.23	22.5
South Africa	.23	22.5
Maldives	.22	24
Peru	.19	25
Guatamala	.18	26
Nigeria	.12	27
Trinidad	.10	28
Morocco	.04	29.5
Algeria	.04	29.5
Total	172.75	
Mean	5.76	

SOURCE: Bureau of Maritime of Liberia, 1985.

Variation in foreign exchange earnings among nations called for a categorization, reflecting those nations that would have been maximally, intermediately, or minimally affected. In an attempt to arrange the nations into categories, those nations whose total revenue was greater than 10 percent of the sample mean (see sample mean on Table 19) were placed in the Maximal Category. Those who fell between negative and positive 10 percent of the sample mean were placed in the Intermediate Category, and those who totaled less than 10 percent of the sample mean were placed in the Minimal Category.

Maximal, Intermediate and Minimal Categories

The Maximal Category (Table 20) consisted of Hong Kong, the Philippines, China, South Korea, India, and Taiwan. These countries accounted for more than 85 percent of the total revenues generated by the seafarers sampled. According to the criterion specified, only Indonesia qualified for the Intermediate Category (Table 21).

The Minimal Category (Table 22), which consisted of the remaining developing nations, accounted for approximately 10 percent of the total revenues generated from supplying of seafarers. Pakistan, Burma,

TABLE 20

MAXIMAL CATEGORY
REVENUE GENERATED BY SEAFARERS
(U.S. MILLIONS OF DOLLARS)
FROM DEVELOPING NATIONS

COUNTRY	ACTUAL	EXPECTED	DIFFERENCE
Hong Kong	38.12	25.54	12.58
Philippines	31.60	21.17	10.43
China	29.00	19.43	9.57
South Korea	27.60	18.49	9.11
India	14.10	9.44	4.65
Taiwan	10.50	7.05	3.47
Total	150.92	101.11	49.81

SOURCE: Author's calculations.

TABLE 21

INTERMEDIATE CATEGORY
REVENUE GENERATED BY SEAFARERS
(U.S. MILLIONS OF DOLLARS)
FROM DEVELOPING NATIONS

COUNTRY	ACTUAL	EXPECTED	DIFFERENCE
Indonesia	5.80	3.88	1.92

SOURCE: Author's Calculations

TABLE 22

MINIMAL CATEGORY
REVENUE GENERATED BY SEAFARERS
(U.S. MILLIONS OF DOLLARS)
FROM DEVELOPING NATIONS

COUNTRY	ACTUAL	EXPECTED	DIFFERENCE
Pakistan	3.30	2.21	1.09
Burma	2.10	1.41	.69
Bangladesh	1.80	1.21	.59
Chile	1.60	1.07	.53
Egypt	1.14	.77	.38
Colombia	.85	.57	.28
Syria	.69	.47	.23
Sri Lanka	.61	.41	.20
Paraguay	.54	.36	.18
Singapore	.54	.56	.18
Jamaica	.39	.26	.13
Turkey	.36	.24	.12
Uruguay	.34	.23	.11
Cape Verde	.27	.18	.09
Thailand	.23	.15	.08
South Africa	.23	.15	.08
Maldives	.22	.15	.07
Peru	.19	.13	.06
Guatemala	.18	.12	.06
Nigeria	.12	.08	.04
Trinidad	.10	.07	.03
Morocco	.04	.03	.01
Algeria	.04	.03	.01
Total	15.88	10.46	5.24

SOURCE: Author's calculations

Bangladesh and Chile accounted for less than 9 million U.S. dollars, while Nigeria, Trinidad, Morocco and Algeria account for a little over Ø.3Ø million.

Even though these categories enabled one to have a general picture of the impact, the application of the Index of Revenue Deduction established whether the expected revenue frequencies differed significantly from the actual. The actual revenue frequences represented the present amount of dollars (U.S.) received by seafarers from those developing countries supplying labor, while the expected revenue frequencies were obtained by an assumption made by officials of the Liberian Shipowners' Council that a 67 percent reduction in the number of seafarers would utimately lead to a 67 percent reduction in the actual revenue received by seafarers. For example, the actual revenue frequency of Hong Kong was 38.12, when multiplied by .67, its expected revenue frequency was 25.54 (see table 2Ø). A positive Index of Revenue Deduction value meant that the actual value exceeded the expected, while a negative value represented the inverse. Also an Index of Revenue Deduction value of zero indicated that no difference existed between the actual and expected revenue frequencies. Accordingly, as the value approached zero, no substantial deviation existed between the actual and

expected revenue frequencies. Moreover, when calculating the IRD, it was advised to square the absolute difference between the total of the actual revenue frequencies and the total of expected revenue, the result was divided by the sum of the total of the actual revenue frequencies and the total of the expected revenue frequencies. For example, the absolute difference between the total of the actual and expected revenue frequencies in the Maximal Category was 49.81, when squared the result is 2481.Ø3. If same was divided by 252.Ø3, the sum of its expected and actual revenue frequencies, the IRD value was 9.84. Based on this, the IRDs for the Intermediate and Maximal categories were calculated as .38 and 1.47 respectively (see Table 23 for all the IRD results).

Summary

The impact on revenue generated by seafarers was thus analyzed in three dimensions -- the maximal, intermediate and minimal. The maximal category, which accounted for 15Ø.92 million dollars was dominated by Hong Kong followed in a decreasing order of importance the Philippines, China, South Korea, India and Taiwan. The intermediate category which consisted of only Indonesia, accounted for less than 6 million dollars;

TABLE 23

INDEX OF REVENUE DISPLACEMENT
FROM DEVELOPING NATIONS

CATEGORY	IRD
Maximal	9.84
Intermediate	.38
Minimal	1.47

SOURCE: Author's Calculations.

and the mimimal which accounted for less than 16 million dollars was dominated by Pakistan, Burma, Bangladesh, Chile and Egypt. The rest of the nations in this category accounted for less than one million dollars each.

The Index of Revenue Deduction (IRD) was used to ascertain which of the three developing nation categories would have been most affected. Accordingly, the ISD of the Maximal Category was most significant, while ISDs of the Intermediate and Minimal Categories were not very significant. Their insignificance stemmed from the establishment made by the criteria used in calculating the ISD which states that "the closer an ISE is to zero, the smaller its significance". It was therefore concluded that foreign exchange earnings were most important to those nations in the maximal category, and less important to those in the intermediate and minimal categories.

CHAPTER SIX

SUMMARY AND CONCLUSIONS

Summary

This study has brought to light the potential impacts of phasing-out of open registries on shipowners, seafarers, and revenues received by seafarers employed on bulk vessels of the Liberian Registry. The phase-out campaign, which began about 10 years ago, was jointly sponsored by the Group of 77, including the People's Republic of China (PRC) and Group D nations. There are two principal reasons for the campaigns against open registries. By offering registration facilities and the right to fly their flags to foreign shipowners, it is contended that open registries have hampered the growth of the national fleets of most developing economies. Secondly, there is a belief that an economic "genuine link" between these ships and open registry nations does not exist.

The phase-out took on a new trend in July of 1985, after previous attempts were made by UNCTAD to reconcile the differences over the definition of economic "genuine link" among its political groups. The new trend was

realized when major political groups including the Group of 77 and the PRC, Group D, Group B, and the open registry nations, agreed upon a liberal definition of the concept of economic "genuine link". Prior to this agreement, no consensus had been reached among these political groups on the issues of ownership, management and manning of vessels; the basic elements of economic "genuine link". Of the three issues, manning became the greatest area of contention. The Group of 77 including the PRC and Group D nations desired to see that a satisfactory part of the crews employed on vessels be nationals of the flag state. On the other hand, Group B nations desired to see that a satisfactory portion of the crews employed on vessels be nationals of the flag state, while taking into account the availability of qualified seafarers within its own territory. The Group of 77 and its collaborators contended that shipowners in most Group B nations were using an unrestrictive policy of manning selections, common to most open registries, to amass huge financial benefits.

Liberia is an open registry nation, which has over 1900 foreign-owned vessels. The application of a satisfactory national crew requirement could cause a massive disenrollment in its fleet, and subsequently encourage unemployment and financial problems for seafarers.

Given that no percentage of seafarers was specified in the views of any of the groups, this thesis assumed that the percentage of seafarers would be 25, 50, 75 or 100 percent. These hypothetical percentages were applied to study whether or not there could be impacts on 30 bulk shipping companies whose manning is dependent on the service of foreign crews under the Liberian Registry. Subsequently, 13,403 seafarers of 30 low and high income nations were examined to discern the potential impact. Also, foreign exchange earnings amounting to 150.92 million dollars were analyzed.

The Chi-Square statistic was used to test whether or not there would be a significant difference in the responses of the 30 bulk company administrators to three possibilities -- to go out of business, automate, and/or reflag their vessels, as the percentage of national crew increased from 25 percent to 100 percent.

The Chi-Square calculations revealed that significant differences occurred among the respondents with regard to all three possibilities. Of the three possibilities automation was the most favorable choice. Evidence of significant differences on response rates occurred mainly between 75 percent and 100 percent, while little variation occurred when applying a 25 percent or 50 percent national flag state crewing requirement.

Bulk companies most affected by either of these percentages included: Seaboard Flour Corporation, Continental Chartering, and Chemco International Leasing Ltd. Those least affected included, Hilton, Skaarup, Libmar Five, and Aluminum Corporation of America.

Variations in the sizes of seafarers supplied by 30 high and low income nations allowed for two additional categories each, reflecting those seafarers that would be maximally and minimally affected. The evaluation of seafarers, which was based on the technique of the Index of Seafarer Displacement (ISD), showed that categories I and III respectively of high and low income nations were extremely affected, although the two other categories were significant. Those nations in the extreme situation included: Spain, Japan, Great Britain, Greece, China, South Korea, and India.

The impact of the potential reduced revenues of 30 developing nations was also examined by the creation of three categories (maximal, intermediate and minimal). The Index of Revenue Displacement (IRD) revealed that only the Maximal Category was to some degree affected. It was comprised of the Philippines, China, South Korea, India and Taiwan which accounted for about 86 percent of the total revenues received.

Conclusions

The analysis of the impact of a phase-out of open registries indicated that bulk companies of the Liberian Registry would have either gone out of business, automated, and/or reflagged their vessels if the required proportion of nationals of flag state increased from 25 to 100 percent. It should be also noted, that several other factors can encourage these possibilities; rising insurance costs, low demand for bulkers, and the political climate in the state of registry.

There were slight differences in the responses of bulk shipowner officials to the possibility of enforcing a 25 or 50 percent crew requirement of nationals of flag state, while extreme variation existed in the responses at 75 and 100 percent. Under a 75 or 100 percent requirement, most shipowner representatives indicated that it would be difficult to earn profits, since the employment of national flag state crews could be more expensive.

Of the three possibilities analyzed, most shipowners preferred automation, which is already present in the shipping industry. The major reason for automation, in fact, was to reduce crew size while at the same time increasing revenues. Going out of business which was the closest alternative to automation can be effective

if shipowners decide to exit the bulk market as a result of a flux in bulk cargoes.

Reflagging, the least desired of the three possibilities, was marked by extreme discrepancies, because most shipowners could not discern which flag would be a better alternative to an open registry.

With respect to the seafarers from both high and low income nations, it was evident that although all four subdivisions would be affected, the principal impacts would have occurred in Spain, Japan, Great Britain, China, South Korea, and India. According to the ISD analyses, seafarers from low income nations would be severely affected. Additionally, it would create an additional burden for their respective governments.

The IRD analysis revealed that most developing nations would be minimally affected, since the total amount generated by seafarers from each nation was only a small percentage of their national incomes. Even though this situation persisted throughout the entire analysis, some developing nations would have been severely affected. The Philippines and China are such examples.

The chain reaction, beginning with the phasing-out of open registries, would have other far reaching impacts. Specifically, as the costs of operation of

bulk companies of the Liberian Registry would have increased, and a reduction in its bulk fleet would be inevitable. This situation could result in a further reduction of Liberia's financial intake from open registry activities which has been estimated at 6 million dollars annually. Generally, this would increase international transport costs since open registries account for about 29 percent of all bulk trade the world over.

The position taken by most developing nations regarding economic "genuine link" would in fact, be detrimental, not only to ship operators and open registry nations, but also to several developing countries. The People's Republic of China, which has aligned itself with the Group of 77 in the campaign against the open registries, serves as one of the chief suppliers of seafarers and generates a substantial amount of revenues from open registry activities.

Even though this research dealt with the potential impacts of economic "genuine link" on ships registered under the Liberian Flag, the situation also reflects on other open registries. The commonalities that exist among open registries support the belief that the Liberian registry is no exception to the general situation. The main commonality among all open

registries is that they depend on the registration of foreign ships to generate revenues which form part of their gross national products.

APPENDIX A

TRUE MANAGEMENT AND BENEFICIAL OWNERSHIP OF OPEN-REGISTRY FLEETS, 1984

Country of True Manager	Country of Registration: Liberia no.	Liberia m.dwt	Panama no.	Panama m.dwt	Cyprus no.	Cyprus m.dwt	Bahamas no.	Bahamas m.dwt	Bermuda no.	Bermuda m.dwt	TOTAL no.	TOTAL m.dwt
US	394	38.6	292	5.5	3	*	25	4.1	3	*	717	48.2
Hong Kong	452	28.5	635	14.1	3	*	1	*	2	*	1,093	42.6
Japan	202	10.3	916	11.9	1	*	--	--	--	--	1,119	22.2
Greece	136	9.4	452	7.2	328	4.8	2	0.1	2	*	920	21.5
UK-based Greek shipowners	75	5.4	54	2.3	37	2.7	--	--	--	--	166	10.5
UK	99	5.7	119	2.3	22	0.1	19	0.4	38	1.2	297	9.7
Monaco	36	3.7	34	2.6	--	--	1	*	--	--	71	6.4
Norway	123	4.6	44	0.9	2	0.6	5	0.2	1	*	175	6.3
West Germany	85	2.2	183	3.1	82	0.6	1	*	1	*	352	6.0
Switzerland	52	3.0	87	1.2	5	0.1	1	*	--	--	145	4.2
US-based Greek shipowners	26	1.7	8	0.1	3	0.1	--	--	--	--	37	2.2
South Korea	10	1.0	74	1.2	--	--	--	--	--	--	84	2.1
Singapore	9	0.4	139	1.0	1	*	1	*	--	--	150	1.4
Netherlands	17	0.7	63	0.5	7	*	6	*	1	*	94	1.3
Italy	12	0.9	29	0.3	5	0.1	--	--	3	*	49	1.2
Indonesia	17	0.3	65	0.9	--	--	--	--	--	--	82	1.2
Israel	18	1.0	5	0.1	1	*	--	--	1	*	25	1.2
Denmark	21	0.8	17	0.1	5	*	17	0.3	--	--	60	1.1
Unspecified	45	1.7	161	2.8	--	--	--	--	--	--	206	4.4
Unidentified	10	0.3	210	1.7	46	0.9	1	--	3	*	270	2.9
70 countries, entities or territories, each managing less than 1m. dwt	63	3.0	369	2.3	45	0.4	16	0.1	10	0.1	530	6.0
Total	1,902	122.9	3,956	62.1	596	11.0	96	5.1	65	1.4	6,615	202.5

APPENDIX A (CONTINUED)

TRUE MANAGEMENT AND BENEFICIAL OWNERSHIP OF OPEN-REGISTRY FLEETS, 1984

Country of Beneficial Ownership	Country of Registration: Liberia no.	Liberia m.dwt	Panama no.	Panama m.dwt	Cyprus no.	Cyprus m.dwt	Bahamas no.	Bahamas m.dwt	Bermuda no.	Bermuda m.dwt	TOTAL no.	TOTAL m.dwt
US	366	38.2	304	7.4	3		25	4.1	16	0.1	714	49.8
Hong Kong	410	27.2	440	10.0	3		1	*	--	--	845	37.3
Greece	247	18.4	516	9.9	368	8.0	2	0.1	2	*	1,135	36.4
Japan	199	10.2	964	12.7	1		--	--	--	--	1,164	22.9
Norway	158	6.3	47	0.9	3	0.6	5	0.2	1	*	214	8.0
West Germany	88	2.2	184	3.1	85	0.7	1		1	*	359	6.0
UK	39	2.3	128	1.9	16	0.1	16	0.4	22	0.8	221	5.6
Switzerland	57	3.3	82	1.3	5	0.1	1	*	--	--	145	4.7
China	5	0.2	114	2.9	--	--	--	--	--	--	119	3.1
South Korea	10	1.0	73	1.2	--	--	--	--	--	--	83	2.1
Pakistan	38	1.3	25	0.5	--	--	--	--	--	--	63	1.8
Israel	25	1.4	5	0.1	2		--	--	1	*	33	1.5
Italy	16	1.0	34	0.4	5	0.1	--	--	3	*	58	1.5
Indonesia	21	0.3	68	1.1	--	--	--	--	--	--	89	1.3
Netherlands	18	0.7	60	0.5	7		8	*	--	*	93	1.2
Monaco	17	1.1	7	0.1	--	--	1	*	--	--	25	1.1
Denmark	21	0.8	16	0.1	5		17	0.3	--	--	59	1.1
Sweden	13	0.9	23	0.1	4		1	*	--	--	41	1.0
Unspecified	69	2.9	164	2.8	--	--	--	--	--	--	233	1.0
Unidentified countries, entities or territories, each managing less than 1m. dwt	10	0.3	210	1.7	46	0.9	1	--	3		270	2.9
Total	75	3.1	492	3.6	43	0.4	17	0.1	16	0.4	643	7.6
	1,902	122.9	3,956	62.1	596	11.0	96	5.1	65	1.4	6,615	202.5

APPENDIX A (CONTINUED)

TRUE MANAGEMENT AND BENEFICIAL OWNERSHIP OF OPEN-REGISTRY FLEETS, 1984

(i) The 'true manager' is the person, company or organisation responsible for day-to-day husbandry of the ship concerned (as distinct from the manager of the company nominally owing the vessel). The country of management has been assumed to be the country of domicile of the true manager.

(ii) The beneficial owner is the person, company or organisation which gains the pecuniary benefits from the shipping operations. *Total less than 0.05m dwt.

NOTE: Column totals may not add exactly due to rounding

SOURCE: UNCTAD.

APPENDIX B

SAMPLE OF BULK COMPANIES OF
LIBERIAN REGISTRY

	NOS	NFC	NDF	B/O
Africa Camellia Shipping Corporation	4	85	15	American/British
Aluminum Company of America	3	104	4	American
Brokerage & Management Corporation	15	109	7	American
Buttercup Shipping	10	145	8	American
Chemco International Leasing Ltd.	30	892	13	American
Continental Chartering	31	599	200	American/Greek
Conti-Osg Associates'	26	675	23	American
Exxon International	6	132	6	American
First Trust Company of St. Paul	9	133	8	American
General Ore International Corporation	18	407	13	American/British
Global Bulk Carrier Inc.	8	182	8	American/Greek
Gogbon Corporation	5	135	15	Greek
Hilton	1	38	2	American
Hugo Neu Corporation	10	144	12	Greek
International Ocean Shipping	40	1579	79	American
International Affiliates	15	104	11	American
Itel Navigation Inc.	24	473	211	British
Levin Metal Corporation	3	74	24	American
Libmar Five Inc.	1	21	9	American
Marcona Conveyor Corporation	23	493	115	Italian
Maru Shipping Company	26	709	98	Greek
Neptune Bulk Carrier	10	192	108	American
Ogden Marine Inc.	4	65	45	Danish
Overseas Shipping Group Inc.	20	320	160	American
Reynold Metal Company	25	524	160	American

APPENDIX B (CONTINUED)

SAMPLE OF BULK COMPANIES OF
LIBERIAN REGISTRY

	NOS	NFC	NDF	B/O
Seaboard Flour Corporation	35	1303	502	American
Sintraxx	4	140	30	British/American
Skaarup Shipping Corporation	1	100	20	British
United States Steel Corporation	3	200	80	American
Utah International Inc.	4	110	10	American
Total	418	10207	1996	

NOS represents Number of Ships
NFC represents Number of Foreign Crew
NDC represents Number of Domestic Crew
B/O represents Beneficial Ownership
SOURCE: Bureau of Maritime of Liberia, 1985

APPENDIX C

HIGH INCOME AND LOW INCOME NATIONS PER CAPITA INCOME

(in thousands U.S. dollars)

HIGH INCOME	PER CAPITA INCOME	LOW INCOME	PER CAPITA INCOME
Sweden	14,821	Greece	4,590
Norway	14,270	Cyprus	2,940
Denmark	12,956	Soviet Union	2,600
Germany	11,142	Algeria	1,951
Netherlands	10,790	Chile	1,950
Finland	10,477	Hong Kong	1,595
Australia	9,914	Jamaica	1,340
Iceland	9,000	South Korea	1,187
Japan	8,460	Colombia	1,112
Great Britain	7,216	Guatamala	1.083
France	7,129	Ecuador	1.050
Spain	5,500	China (PRC)	566
		Egypt	560
		Indonesia	560
		Cape Verde	200
		Burma	175
		India	150
		Bangladesh	105

Total of both high and low income nations per capita income 147765.79

*Mean 4925.52

SOURCE: The World Almanac, 1985.

APPENDIX D

SAMPLE OF DEVELOPING NATIONS

1. Algeria
2. Bangladesh
3. Burma
4. Cape Verde
5. Chile
6. China
7. Colombia
8. Egypt
9. Guatemala
10. Hong Kong
11. India
12. Indonesia
13. Jamaica
14. Morocco
15. Maldives
16. Nigeria
17. Philippines
18. Peru
19. Paraguay
20. Pakistan
21. Syria
22. Sri Lanka
23. Singapore
24. South Africa
25. South Korea
26. Taiwan
27. Turkey
28. Thailand
29. Trinidad
30. Uruguay

SOURCE: Bureau of Maritime of Liberia, 1984.

APPENDIX E

PERCENTILE VALUES (X_p) FOR THE CHI-SQUARE DISTRIBUTION WITH ν DEGREES OF FREEDOM

ν	$\chi^2.995$	$\chi^2.999$	$\chi^2.975$	$\chi^2.95$	$\chi^2.90$	$\chi^2.75$	$\chi^2.50$	$\chi^2.25$	$\chi^2.10$	$\chi^2.05$	$\chi^2.025$	$\chi^2.01$	$\chi^2.005$
1	7.88	6.63	5.02	3.84	2.71	1.32	.455	.102	0.158	.0039	.0010	.0002	.0000
2	10.6	9.21	7.38	5.99	4.61	2.77	1.39	.575	.211	.103	.0506	.0201	.0100
3	12.8	11.3	9.35	7.81	6.25	4.11	1.27	1.21	.584	.352	.216	.115	.072
4	14.9	13.3	11.1	9.49	7.78	5.39	3.36	1.92	1.06	.711	.484	.297	.207
5	16.7	15.1	12.8	11.1	9.24	6.63	4.35	2.67	1.61	1.15	.831	.554	.412
6	18.5	16.8	14.4	12.6	10.6	7.84	5.35	3.45	2.20	1.64	1.24	.872	.676
7	20.3	18.5	16.0	14.1	12.0	9.04	6.35	4.25	2.83	2.17	1.69	1.24	.989
8	22.0	20.1	17.5	15.5	13.4	10.2	7.34	5.07	3.49	2.73	2.18	1.65	1.34
9	23.6	21.7	19.0	16.9	14.7	11.4	8.34	5.90	4.17	3.33	2.70	2.09	1.73
10	25.2	23.2	20.5	18.3	16.0	12.5	9.34	6.74	4.87	3.94	3.25	2.56	2.16
11	26.8	24.7	21.9	19.7	17.3	13.7	10.3	7.58	5.58	4.57	3.82	3.05	2.60
12	28.3	26.2	23.3	21.0	18.5	14.8	11.3	8.44	6.30	5.23	4.40	3.57	3.07
13	29.8	27.7	24.7	22.4	19.8	16.0	12.3	9.30	7.04	5.89	5.01	4.11	3.57
14	31.3	29.2	26.1	23.7	21.1	17.1	13.3	10.2	7.79	6.57	5.63	4.66	4.07
15	32.8	30.6	27.5	25.0	22.3	18.2	14.3	11.0	8.55	7.26	6.26	5.23	4.60
16	34.3	32.0	28.8	26.3	23.5	19.4	15.3	11.9	9.31	7.96	6.91	5.81	5.14
17	35.7	33.4	30.2	27.6	24.8	20.5	16.3	12.8	10.1	8.67	7.56	6.41	5.70
18	37.2	34.8	31.5	28.9	26.0	21.6	17.3	13.7	10.9	9.39	8.23	7.01	6.26
19	38.6	36.2	32.9	30.1	27.2	22.7	18.3	14.6	11.7	10.1	8.91	7.63	6.84

APPENDIX E (CONTINUED)

PERCENTILE VALUES (χ^2) FOR THE CHI-SQUARE DISTRIBUTION
WITH V DEGREES OF FREEDOM

V	$\chi^2.995$	$\chi^2.999$	$\chi^2.975$	$\chi^2.95$	$\chi^2.90$	$\chi^2.75$	$\chi^2.50$	$\chi^2.25$	$\chi^2.10$	$\chi^2.05$	$\chi^2.025$	$\chi^2.01$	$\chi^2.005$
20	40.0	37.6	34.2	31.4	28.4	23.8	19.3	15.5	12.4	10.9	9.59	8.26	7.43
21	41.4	38.9	35.5	32.7	29.6	24.9	20.3	16.3	13.2	11.6	8.90	8.03	
22	42.8	40.3	36.8	33.9	30.8	26.0	21.3	17.2	14.0	12.3	11.0	9.54	8.64
23	44.2	41.6	38.1	35.2	32.0	27.1	22.3	18.1	14.8	13.1	aa.7	10.2	9.26
24	45.6	43.0	39.4	36.4	33.2	28.2	23.3	19.0	15.7	13.8	12.4	10.9	9.89
25	46.9	44.3	40.6	37.7	34.4	29.3	24.3	19.9	16.5	14.6	13.1	11.5	10.5
26	48.3	45.6	41.9	38.9	35.6	30.4	25.3	20.8	17.3	15.4	13.8	12.2	11.2
27	49.6	47.0	43.2	40.1	36.7	31.5	26.3	21.7	18.1	16.2	14.6	12.9	11.8
28	51.0	48.3	44.5	41.3	37.9	32.6	27.3	22.7	18.9	16.9	15.3	13.6	12.5
29	52.3	49.6	45.7	42.6	39.1	33.7	28.3	23.6	19.8	17.7	16.0	14.3	13.1
30	53.7	50.9	47.0	43.8	40.3	34.8	29.3	24.5	20.6	18.5	16.8	15.0	13.8
40	66.8	63.7	59.3	55.8	51.8	45.6	39.3	33.7	29.1	26.5	24.4	22.2	20.7
50	79.5	76.2	71.4	67.5	63.2	56.3	49.3	42.9	37.7	34.8	32.4	29.7	28.0
60	92.0	88.4	83.3	79.1	74.4	67.0	59.3	52.3	46.5	43.2	40.5	37.5	35.5
70	104.2	100.4	95.0	90.5	85.5	77.6	69.3	61.7	55.3	51.7	48.8	45.4	43.3
80	116.3	112.3	106.6	101.9	96.6	88.1	79.3	71.1	64.3	60.4	57.2	53.5	51.2
90	128.3	124.1	118.1	113.1	107.6	98.6	89.3	80.6	73.3	69.1	65.6	61.8	59.2
100	140.2	135.8	129.6	124.3	118.5	109.1	99.3	90.1	82.4	77.9	74.2	70.1	67.3

SOURCE: Catherine M. Thompson, Table of percentage points of the X distribution, Biometrika, Vol. 32 (1941), by permission of the author and publisher.

REFERENCES CITED

Boczek, B. (1962), Flags of Convenience, An International Legal Study, Cambridge: Harvard University Press.

Bronwick, K. and Voll, M. (1981), The Automation of Ships, Chicago: Aldine Publishing Company.

Bureau of Maritime of Liberia Review, (1979-1985), Monrovia.

Clark, F. (1984), Crew Cost Analyses, London: Oxford Press.

Davies, A. (1984), The Existence of Open Registry Shipping, Englewood Cliffs: Prentice-Hall.

Dixit, K. (1985), "Flags Without Convenience," Development Forum, pp. 1-3.

Economic Impact of Open Registry Shipping, (1979), Washington, DC: Bureau of Maritime of Liberia..

Economist Intelligence Unit, (1979), London: Spencer House.

Fairplay, (1982-1985).

Gold, E. (1981), The Evolution of International Marine Policy and Shipping Law, Lexington: D.C. Heath and Company.

Goldie, L. (1963), Recognition and Dual Nationality-A Problem of Flags of Convenience, New York: The Macmillian Company.

Gwartney, J. and Stroup R. (1983), Microeconomics, New York: McGraw-Hill.

Heilbronner, L. and Thurow, C. (1981), Understanding Microeconomics, New York: John Wiley & Sons.

International Maritime Associates, (1979), Washington.

Johnson, F. (1985) Automation and Vessels, San Francisco Wadsworth Publishing Company.

Journal of Maritime Law and Commerce, (1980-1985).

Kendall, L. (1983), The Business of Shipping, Centreville: Cornell Maritime Press.

Liberian Shipowners' Council, (1984), Open Registries and Merchant Fleets of Developing Countries, Washington, D.C.

Loree, P. (1985), "Bulk Trade Pressure Seen Deciding Winners and Losers," FACS Forum, October, p. 3-6.

McConnell, M. (1985), Darkening Confusion Mounted Upon Darkening Confusion, The Search for Elusive Genuine Link, Journal of Maritime Law and Commerce, Vol. 16, pp. 369-380.

McKay, J. (1985), "New Trend in UNCTAD," European Shipping Week, Vol. 8, p. 4-6.

Miller, S. (1985), "New Development in Shipping at UNCTAD," Seafarers Development Forum, Vol. 2, pp. 4-9.

Ministry of Finance of Liberia, (1984) Annual Report, Monrovia.

Moore, J. (1979), New Trends in Maritime Navigation, New York: Macmillian Company.

National Seamen Board (1980), Annual Report, p. 86.

Resnich, A. (1982), Commodity Flow from Developing to Developed Nations, London: Charles Griffin and Company.

Rowlinson, M. (1985), Flags of Convenience, the UNCTAD Case, Maritime Policy and Management, Vol. 12, No. 3, pp. 241-244.

Seatrade, (1982-1985).

Siegel, S. (1956), Nonparametric Statistics for the Behavioral Sciences, New York: McGraw-Hill.

Spiegel, M. (1961), Theory and Problems of Statistics, New York: McGraw-Hill Book Company.

Stiegeler, S. and Thomas, G. (1976), A Dictionary of Economics and Commerce, London: Pan Books Ltd.

Taylor, P. (1977), Analysis of Land Use CLasses: An Introduction to Spatial Setting, Boston: Houghton Mifflin Company.

Triola, M. (1981), Elementary Statistics, New York, McGraw-Hill.

UNCTAD, (1984), Report of United Nations Conference on the Conditions for the Registration of Ships, Geneva, TD/RS/Conf/10.

UNCTAD, (1984), Report of United Nations Conference on the Conditions for the Registration of Ships, Geneva, TD/RS/Conf.10/Add.1

UNCTAD, Merchant Fleet Development, Geneva, TD/B/C.4/203/1980.

UNCTAD, Beneficial Ownership of Open Registry Fleet, Geneva TD/222/1979.

UNCTAD, Repercussion of Phasing-out Open Registries, Geneva, TD/B/C.4/AC/1979.

UNCTAD, Economic Consequences of Existence or the Lack of Genuing Link Between Vessels and Flag of Registry, Geneva, TD/B.c.4/168/1977.

UNCTAD, Committee of Enquiry into Shipping-Report, TD/B/C.4/168/1970.

UNCTAD Bulletin (1985), June-July, No. 213, pp. 1-3.

Vail, B. (1985), "UNCTAD Salutes the Status Quo", American Shipper, Vol. 27, No. 9, pp. 64-70.

Weeks, J. (1981), The Political Side of Shipping, Boston: Addison-Wesley Publishing Company, Inc.

Webster-Mariam, (1983), Webster's Ninth New Collegiate Dictionary, Boston: Merriam-Webster Inc..

Washington Post, (January), 1982, p. 3.